

CERTAIN
PHYSICAL EDUCATION
FACILITIES
IN
EASTERN JUNIOR AND SENIOR
HIGH SCHOOLS
YEARS 1927 *and* 1928

CRITERIA FOR GYMNASIUMS, OFFICES
AND SERVICE ROOMS

B Y
HERBERT BLAIR, PH.D.
Professor of School Administration
SCHOOL OF EDUCATION
Boston University

Published with the Approval of
PROFESSOR N. L. ENGELHARDT
Sponsor



A. S. BARNES & COMPANY
NEW YORK
1938

Submitted in partial fulfilment of the
requirements for the Degree of Doctor of
Philosophy, in the Faculty of Philosophy,
Columbia University.

Copyright, 1938, A. S. Barnes & Company, Inc.

THIS BOOK IS FULLY PROTECTED BY
COPYRIGHT AND NOTHING THAT AP-
PEARS IN IT MAY BE REPRINTED OR
REPRODUCED IN ANY MANNER, EITHER
WHOLLY OR IN PART, FOR ANY USE
WHATEVER, WITHOUT SPECIAL WRITTEN
PERMISSION OF THE COPYRIGHT OWNER.

*

THIS EDITION WAS PRINTED
IN THE ONE HUNDREDTH ANNIVERSARY YEAR
OF A. S. BARNES AND COMPANY

PRINTED IN THE UNITED STATES OF AMERICA

CONTENTS

<i>Chapter</i>	
	<i>Page</i>
I NATURE AND NEED FOR THE STUDY	I-II
The Problem	I
Need for the Study	3
<i>Physical Education a New Subject</i>	3
<i>Legislative Requirements</i>	6
<i>Cost for Facilities</i>	8
<i>Variety of Facilities</i>	8
<i>Value of the Study</i>	9
Methods of Procedure	9
<i>School Architects</i>	9
<i>New School Buildings</i>	10
<i>Visits to Selected Schools</i>	10
II To MEASURE THE PHYSICAL EDUCATION FACILITIES	12-53
Physical Director's Office	12
Examination Room	14
Gymnasium	16
<i>Number</i>	16
<i>Location</i>	17
<i>Size</i>	20
<i>Height</i>	21
<i>Light</i>	22
<i>Walls</i>	24
<i>Floors</i>	25
<i>Bleachers</i>	26
<i>Corrective Gymnasium</i>	28
<i>Apparatus Room</i>	29
<i>Dressing Rooms</i>	30
<i>Showers</i>	34
<i>Team Room</i>	46
<i>Sanitary Features</i>	48
<i>Towel and Suit Facilities</i>	48
<i>Drying Room</i>	49
Summary	50

III	A SCORE CARD FOR MEASURING THE PHYSICAL EDUCATION FACILITIES	54-128
	Construction	54
	Score Card	62
	Application of the Score Card	68
	<i>Departmental Offices</i>	69-75
	<i>Director's Office</i>	69
	<i>Examination Room</i>	75
	<i>Gymnasiums</i>	75-104
	Number	75
	Location	77
	Size and Height	83
	Light	85
	Walls	91
	Floors	91
	Bleachers	91
	Corrective Gymnasiums	98
	Apparatus and Storage Rooms	98
	<i>Service Facilities</i>	104-133
	Dressing Rooms	104
	Shower Rooms	110
	Team Room	122
	Sanitary Features	127
	Towel and Suit Facilities	133
	Drying Clothing	133
	Summary	133
IV	POSSIBLE REASONS FOR DIFFERENCES IN PROVISIONS FOR THE PHYSICAL EDUCATION PROGRAM	141-152
	Many Different Architects	141
	Local Architects Preferred	143
	Variety in Physical Education Programs	143
	Indefiniteness of State Courses	146
	State School House Building Codes	149
	Summary	152
V	SUMMARY	153-164
	Possible Remedies	156
	Conclusions	159
	Bibliography	165
	Surveys Used in This Report	169
	Cities Visited	171

DIAGRAMS

SCATTER DIAGRAM NUMBER OF SHOWERS FOR GIRLS AND SIZE OF GYMNASIUM CLASS	38
TYPES OF SHOWERS	39
DEPARTMENTAL OFFICES	70-73
LOCATION OF GYMNASIUM	78-81
LIGHT FOR GYMNASIUM	86-89
BLEACHERS	93-96
APPARATUS AND STORAGE ROOMS	99-102
BOYS' DRESSING ROOMS	105-108
BOYS' SHOWER ROOMS	111-114
GIRLS' SHOWER ROOMS	117-120
TEAM ROOMS	123-126
SANITARY FEATURES	128-131
FREQUENCY POLYGON PERCENTAGE OF LIGHT FOR THE GYM- NASIUM	140
Two BUILDINGS With SMALL ENROLLMENT	162

T A B L E S

<i>Number</i>		<i>Page</i>
I.	LOCATION OF PHYSICAL DIRECTOR'S OFFICE	14
II.	WIDTH AND LENGTH OF THE OFFICE FOR THE PHYSICAL DIRECTOR	15
III.	PLACEMENT OF LOCKER ROOM IN RELATION TO THE GYMNASIUM	32
IV.	AREA PER PUPIL IN BOYS' LOCKER ROOMS	33
V.	RATING OF DIFFERENT TYPES OF SHOWERS	44
VI.	EVALUATION OF FACILITIES FOR PHYSICAL EDUCATION	56
VII.	EVALUATION OF FACILITIES FOR PHYSICAL EDUCATION	58
VIII.	SCORE FOR DIRECTOR'S OFFICE	74
IX.	SCORE FOR NUMBER OF GYMNASIUMS	76
X.	SCORE FOR LOCATION OF GYMNASIUMS	82
XI.	SCORE FOR SIZE AND HEIGHT OF GYMNASIUM	84
XII.	SCORE FOR LIGHT FOR GYMNASIUM	90
XIII.	SCORE FOR BLEACHERS	97
XIV.	SCORE FOR APPARATUS AND STORAGE ROOMS	103
XV.	SCORE FOR BOYS' DRESSING ROOMS	109
XVI.	SCORE FOR BOYS' SHOWER ROOMS	115
XVII.	NUMBER OF SHOWERS FOR GIRLS COMPARED WITH THE NUMBER FOR BOYS	121
XVIII.	SCORE FOR GIRLS' SHOWER ROOMS	121
XIX.	SCORE FOR SANITARY FEATURES	132
XX.	TOTAL SCORES FOR PHYSICAL EDUCATION FACILITIES	134
XXI.	FREQUENCY DISTRIBUTION OF TOTAL SCORES	135
XXII.	QUARTILE AND MEDIAN LEVELS	138
XXIII.	FREQUENCY DISTRIBUTION OF THE PERCENTAGE OF LIGHT FOR THE GYMNASIUM	139

ACKNOWLEDGMENTS

TO MY DISSERTATION COMMITTEE: Professor N. L. Engelhardt who suggested the problem and who patiently and constantly encouraged the undertaking to its conclusion; Professor George D. Strayer, whose keen analysis of the weak points of each presentation was both the despair and the delight of those so fortunate as to be in the Administration Seminar; and Professor Jesse F. Williams, who has been the leader in changing physical training for the few into physical education for the many, I am indebted beyond my ability ever to repay.

I wish also to express my very great appreciation to Mr. J. J. Carey, Supervisor of Plans, Massachusetts; Mr. Joseph H. Hixson, School Buildings and Grounds, New York; Mr. Charles McDermott, Inspector of School Buildings, New Jersey; and Dr. Hubert C. Eicher, Director School Buildings Division, Pennsylvania. Each permitted me to work for many days in his office, furnished me with the school building plans I desired to copy, and gave very generously of his time in answering my numerous questions.

The architects of the one hundred seven buildings studied have been very helpful. They gave me the desired information regarding cubage, costs, and materials used, and checked my figures for accuracy. The principals and directors of physical education, without exception, answered my questions regarding their use of the facilities provided in these new buildings.

Mr. James E. Rogers, Director, National Physical Education Service, National Recreation Association, gave me the opportunity of using his very complete file of State courses of study for physical training.

The score card was evaluated and the descriptions of the several items criticized and greatly improved by the following directors and professors of physical education:

STATE DIRECTORS: C. Harry Edwards, Maine; Carl L. Schrader, Massachusetts; Hiram Jones, New York; George F. Hendricks, Delaware; R. N. Sandlin, Texas; Assistant Director William P. Uhler, Jr., New Jersey; Winifred Van Hagen, Chief, Bureau of Physical Education for Girls, California; James F. Rogers, United States Consultant in Hygiene, Office of Education, Washington.

PROFESSORS: Frederick Rand Rogers, Charles D. Giauque, Boston; Jesse F. Williams, Clifford L. Brownell, F. W. Maroney, Teachers College, Columbia; Jay B. Nash, New York; Howard Braucher, National Recreation Association, New York; H. Harrison Clarke, Syracuse; C. W. Savage, Oberlin; Elmer Mitchell, Jackson Sherman, Michigan; W. W. Patty, Indiana; Arthur H. Steinhaus, Y.M.C.A. College, Chicago; G. H. McCloy, Iowa; Chester L. Brewer, Missouri; Mabel Lee, Nebraska; Harry A. Scott, Rice Institute; N. P. Neilson, Stanford; Frederick W. Cozens, Los Angeles, California; William La Porte, Southern California; John F. Bovard, Oregon.

CITY DIRECTORS: Charles C. Wilson, Hartford, Connecticut; Franklin G. Armstrong, Montclair, New Jersey; Dorothy La Salle, East Orange, New Jersey; Horace G. Geisel, Harrisburg, Pennsylvania; Robert H. Wolfe, Altoona, Pennsylvania; Harold W. Herkimer, Niagara Falls, New York; Floyd A. Rowe, Cleveland, Ohio; F. G. Keller, Toledo Ohio; Emil Rath, Indianapolis, Indiana; Alfred O. Anderson, Kansas City, Missouri; Claire Colestock, Pasadena, California.

Only through a study of this kind does one come to realize how large a portion of any piece of work is due to the co-operation of others and how little is the real contribution of the one who gets the credit for putting the material together.

H. F. B.

PHYSICAL EDUCATIONAL
FACILITIES
FOR THE MODERN
JUNIOR AND SENIOR
HIGH SCHOOL

Chapter I

NATURE AND NEED FOR THE STUDY

THE PROBLEM

THE purpose of this study has been to determine to what extent the facilities that are provided for the physical education program in our junior and senior high schools conform to the standards that are generally recognized by educators as being necessary to carry out an adequate physical education program. The states of Massachusetts, New York, New Jersey, and Pennsylvania were chosen for intensive study. These four states were selected because:

1. In each the state legislature has required by statute that physical education be taught.
2. Each has a state director of physical education.
3. Each has a state department for the approval of plans for school buildings.
4. Each, either by statute (New Jersey) or by act of the state department of education (Massachusetts, New York, and Pennsylvania), has a minimum time requirement for the physical education program.

Massachusetts.

Section 1. (As amended, 1921, 360; 1923, 222).

Schools shall give instruction and training in orthography, reading, writing, the English language and grammar, geography, arithmetic, drawing, the history and constitution of the United States, the duties of citizenship, physiology and hygiene, good behavior, *indoor and outdoor games and athletic exercise*.

Manual for Teachers in Junior and Senior High Schools.

At least two sixty minute periods each week should be devoted to physical education in addition to the time given to instruction in hygiene. A sixty minute period may be divided as follows: Seven minutes for change of clothing, ten for floor work, thirteen for bath and dressing and thirty to be devoted to work on apparatus, dancing, athletics or games.

New York.

Consolidated Laws of New York, 10,478.

All male and female pupils above the age of eight years in all elementary and secondary schools shall receive as part of the prescribed courses of instruction therein such physical training under the direction of the commissioner of education as the regents, after conference with the military training commission, may determine, during periods which shall average at least twenty minutes in each school day. Pupils above such age attending the public schools shall be required to attend upon such prescribed courses of instruction.

General Plan and Syllabus for Physical Training in the Elementary and Secondary Schools of the State of New York. 1917.

The plan adopted by the Board of Regents contemplates that physical training be construed as covering (1) individual health examination, (2) instruction concerning the care of the body and (3) physical exercise as a health habit including gymnastics, elementary marching and organized, supervised play.

In secondary schools. Gymnastic drills, a minimum of 60 minutes a week of actual work on the floor. A uniform is urged with drills followed by a bath where possible. Supervised recreation, 60 minutes a week for which gymnastic drills may be substituted.

New Jersey.

Section 1.

There shall be established and made a part of the course of instruction in the public schools of the State "A Course in Physical Training." Such course shall include exercises, calisthenics, formation drills, instruction in correcting and preventing bodily deficiency, and such other features as may aid in carrying out these purposes.

Section 2.

The course prescribed shall be prepared by the state commissioner and when approved by the state board shall constitute the prescribed course in physical education.

Section 3.

Every pupil shall take the course in physical training as herein provided.

Section 4.

The time devoted to such courses shall aggregate at least $2\frac{1}{2}$ hours in each school week.

State of New Jersey, Standards in Physical Education. 1932. Secondary Schools.

As rapidly as the several factors permit the desirable standard of a daily period should be adopted. A popular alternative is four periods a week

of physical education and one period a week of health education for a given pupil.

Plans for expansion, such as building-construction, the purchase of land, and curriculum revision extending over a period of years should take into account the increasing recognition of physical education and the demand for adequate time allotment.

Pennsylvania.

Pennsylvania Acts of 1921. Sec. 1607.

In every elementary public and private school established and maintained in this Commonwealth the following subjects shall be taught . . . training in safety first methods, and the humane treatment of birds and animals, health, including physical training. . . . Other subjects shall be taught in the public elementary schools and also in the public high schools as may be designated or approved by the State Board of Education.

Bulletin No. 49, 1929. *Physical Education for Small Secondary Schools.* p. 16.

The time required by the Department of Public Instruction for physical education in the Secondary Schools is two periods a week and for health instruction one period. The length of these periods shall be the same as for other subjects. The only exception to the above is for a pupil who is physically unable to participate. Course of Study in Physical Education. Grades 9-12. 1925.

NEED FOR THE STUDY

No other single subject in the secondary curriculum has been introduced so recently, has been subject to so much mandatory legislation, has cost so much for facilities and equipment in proportion to the per pupil use, or has such a variety of facilities considered essential for its proper development as has physical education.

PHYSICAL EDUCATION A NEW SUBJECT

McLean¹ in replies from 2,492 high schools in 1910 found that 231 said they had regular instruction in gymnastics. He reports that gymnastics were first required in 1888 by one school, in 1892 by another, in 1900 by four schools, in 1902 by four, in 1904 by eight, in 1905 by nine, in 1906 by ten, in 1907 by seventeen, in 1908 by

¹ McLean, R. H. *Physical Education in Public Secondary Schools in the United States.* 1914. Unpublished Master's Thesis, Springfield.

twenty-five, in 1909 by thirty-seven. One hundred eighty-seven, seven and a half per cent of the entire number, reported gymnasium facilities.

A compilation was made of all references to physical education facilities in one hundred sixteen school surveys from 1900 to 1929, mainly those used in Caswell's¹ *City School Surveys*. The ones omitted were those devoted to pupil achievement, organization, curriculum, class instruction, or those conducted in small school systems mainly by single investigators.

Only one, Chicago (1900), was made previous to 1910 and its sole reference is "Drawing, music and physical culture have been pursued for some years in our Chicago Schools and these studies have justified themselves. It is recommended that suitable accommodations for work in physical culture be provided wherever possible and if necessary in an assembly hall or playroom."

Grouping the other surveys by five year periods there were fifteen for 1910-14 with one, Portland, Oregon, using what Davis² calls the extensive technique method for judging the physical education facilities and program. For 1915-19 there were twenty-four surveys, eight classified by Davis as using the extensive technique. There were twenty-eight in 1920-24, five of them "extensive," and thirty-eight in 1925-29 with eight of these "extensive."

Two printed pages would include all that was said about physical education facilities in the fifteen surveys of 1910-14. Boston (1911) points out that but three of thirty-five new buildings had gymnasiums; Atlanta (1912) makes no mention of indoor facilities. New York (1912) recommends that a maximum amount of the two periods required for physical training each week be actual physical exercise with a minimum amount of time devoted to theory. Bridgeport (1913) reports no gymnasium in either the high school or normal school, and that instruction in physical education in the latter was mostly dictation and note taking. Portland (1913) recommends special orthopedic exercises to be given after school about three

¹ Caswell, H. L. *City School Surveys*. Bureau of Publications, Teachers College, Columbia University. 1929.

² Davis, Elwood C. *Methods and Techniques Used in Surveying Health and Physical Education in City Schools*. Bureau of Publications, Teachers College, Columbia University. 1932.

times a week. "Baths, in the basement, ought also to be added." Butte (1914) recommends a new high school with a large gymnasium. San Francisco (1914) states that not one elementary school has a school bath, or a gymnasium; South Bend (1914) described the pool, double gymnasium, and complete equipment. Springfield, Illinois (1914), points out that the high school is under a great handicap in having no athletic field or gymnasium.

For the next five year period (1915-1919) increasing emphasis is placed in the surveys on the lack of proper facilities necessary for an adequate physical education program. Taking only the eight listed by Davis as cities where the extensive technique was used for the physical education portion of the survey, Leavenworth (1915) deplores the lack of gymnasium, school baths, and athletic field. In Salt Lake City, the physical education in the high school was chiefly military training. San Antonio points out the need of providing "Indoor facilities for rhythmic, folk and gymnastic games." The Cleveland survey (1916) says that the schools are unusually well provided with gymnasiums, playrooms, pools and showers. A Chart of the special rooms in eleven buildings shows fourteen gymnasiums, fourteen playrooms, eleven buildings with showers. The Denver survey (1916), in pointing out that only one of the five high schools had a gymnasium, emphasizes that physical education is an indispensable phase of education and required a new type of school building.

The Brookline survey criticizes very definitely the condition of the public gymnasium used by the high school: "Its unenclosed wooden stairs, scattered dressing rooms and badly arranged showers scarcely used by girls." It recommends one shower for each five boys, twenty-four square feet for each shower, eight square feet in the dressing room, exclusive of lockers, for each pupil in the largest class; for girls, closed shower baths, 3 feet by 3 feet, one for each three girls.

The St. Louis survey (1917), in taking the gymnasiums and equipment provided as evidence that physical training is an important phase of secondary education, makes the first criticism of too elaborate allotment of space in stating that "the elementary build-

ings in general are well equipped with playrooms. In many cases there are four which seems to be a waste of space."

In the 1920-24 period more emphasis is placed upon the kind of facilities provided and their proper location. The Baltimore survey (1921) calls attention to the fact that "physical facilities should be maintained at such a standard as to provide adequately for wholesome play and to insure health and proper development of school children."

The Niagara Falls survey (1921) states that the building program provides for two gymnasiums and swimming pool for each new junior high school and recommends that much needed play space be provided in every elementary school. The Alexandria (1923) survey also recommends two gymnasiums, with a woman director for the girls.

The Stamford (1923) survey, in criticizing the placing of the playrooms in the basement states that the special facilities should be in no case makeshift, temporary, or less adequate in nature than the classrooms themselves.

In Havelock, Nebraska, Professor F. E. Henzlik shows a definite need for new gymnasium and apparatus. "The present seating facilities are inadequate and the floor too small, being only 38 by 60 feet."

For Perth Amboy, Professor Williams mentions the one gymnasium, little dressing area, two showers without curtains, meager equipment, unsanitary conditions and recommends a new gymnasium as "apparently the only solution."

LEGISLATIVE REQUIREMENTS

Flanders¹ shows that in 1913 seven states required that physical education be taught. Two, North Dakota and Oregon, made the time mandatory. In 1923, twenty-five states required physical education, fourteen specifying the minimum time. Gorman² shows that by 1929 thirty states required the state department to outline a course in physical education, twenty-six make it compulsory in the high

¹ Flanders, Jesse K. *Legislative Control of the Elementary Curriculum*. Teachers College, Columbia University. Contributions to Education, No. 195, p. 67. 1925.

² Gorman, Fred R. *Legal Status of Physical Education in the United States*. Unpublished Master's Thesis. 1929. School of Education, Indiana University.

schools, fifteen specify the minimum amount of time, sixteen specify the type of instruction.

Jorgensen¹ in pointing out that from 1910 to 1920 "the scope of physical education in the schools has been broadened by appropriate legislation in no less than twenty-one states" shows that these laws not only require that physical education be made a part of the program but California, Michigan, New Jersey, New York, and Oregon specify the age or grade limits, and California, New Jersey, New York, and Oregon make it a requirement for promotion or graduation. The time requirements are quite generally specified in the law and the state department of education required to prescribe courses, see that they are introduced and supervise the instruction given.

Gorman also states that few cases concerning physical education have been brought before the courts, indicating the general acceptance of the authority of the legislature and state departments to make requirements on the subject, but in each case which has come before the courts, the decision has upheld the authority to provide for physical education.

Weinke² after pointing out the very rapid growth in compulsory legislation for physical education since 1917 says that more legislation in this field is needed.

1. They should have carefully defined terms and definitely specified requirements.
2. The laws must clearly stipulate by whom the courses shall be prescribed, enforced and supervised.
3. A minimum time requirement shall be set for physical education of from four to five hours per week.
4. National and state aid are needed.

Meredith³ writing in 1933 brought out that "the thirty-seven states having legislation for health and physical education represent 90 per cent of the total population of the United States. With the two

¹ Jorgensen, Alberta W. *Progress of Physical Education in the Public Schools of the United States During the Decade of 1910-1920 with Special Reference to Legislation and Curricula*. Unpublished Master's Thesis (1929), School of Education, New York University.

² Weinke, Ernest Albert. *Needed Legislature for Physical Education*. Unpublished Master's Thesis (1924).

³ Meredith, W. F. *Regulations Concerning the Acceptance of Health and Physical Education for College Entrance Credit*. Law Abstract Company, Norwalk, Ohio, 1933.

states requiring health and physical education (as a result of rulings of the state boards of education) this is raised to 93 per cent."

Williams and Brownell¹ devote a chapter to the legal aspects of administration of health and physical education showing that the "law itself is complex, and beyond the maze of legal decisions, attorney general's rulings, and statutes are the widely varying practices established by custom or even explicitly provided by rulings of the state departments of education."

COST FOR FACILITIES

Nash,² in a table of eight leading cities showing the cost comparison of space devoted to the physical education plant compared to the cost of the total school plant, lists Minneapolis with 12.9 per cent in the senior high school and Des Moines and Oklahoma City each with 25 per cent. The average for the group is 21.4 per cent of the cost of the building for physical education facilities.

In the one hundred seven buildings in Massachusetts, New York, New Jersey and Pennsylvania included in this study, the architects' statements of the cubical contents devoted to physical education show a range from 10 per cent to 33 per cent with half of the building having from 14 to 21 per cent allotted to physical education.

VARIETY OF FACILITIES FOR PHYSICAL EDUCATION

The names alone of the various rooms that are provided for the physical education department show how complex the problem has become: Gymnasium Room, Spectators' Gallery, Running Track, Director's Office, Examination Room, Corrective Gymnasium, Locker Room, Dressing Room, Shower Room, Drying Room, Team Room, Visiting Team Room, Rest Room, Supply Room, Apparatus Room, and Laundry Room.

For each of these a preferred number of rooms, a preferred location, size, lighting and equipment have been indicated by directors of physical education and specialists in schoolhouse planning. In our most recently constructed buildings the provisions for the activity represented by each of these rooms ranges from none at all to a more

¹ Williams and Brownell. *The Administration of Health and Physical Education*, W. B. Saunders Company, Philadelphia, 1934. Chapter IV, pp. 76-108.

² Nash, Jay B. *The Administration of Physical Education*, 1931, p. 221.

liberal allowance of space than is advocated by any writer in this field.

The rapid introduction of the subject, its mandatory requirements, the expense, as well as the demands of its advocates for still greater expansion, would seem to justify a comparison of the facilities that are now included in our high school buildings with what is being recommended by specialists in schoolhouse planning and by those who are responsible for the physical education program.

VALUE OF THE STUDY

The study should be of service to state departments of education, architects, superintendents, teachers of physical education and school board members in reaching a common agreement as to what is most essential for the physical education department. It should also be of service in showing how, under our present custom of selecting local architects for school buildings, facilities may be secured that more nearly meet these generally accepted essentials.

METHODS OF PROCEDURE

SCHOOL ARCHITECTS

Letters were written to all state commissioners of education asking each for a list of the leading school architects in the state. Replies were received from thirty-three with lists of from one to twelve firms, a total of one hundred fifty architects. By consulting the files of the *American School Board Journal*, the *American Architect*, the *Architectural Forum* and the list of Architects for Educational Buildings in the American School and University, this list was reduced to fifty representing wide geographical distribution and as broad school building experience as could be determined by this method of selection.

To each of the fifty firms a letter was sent that stated the problem and asked if they would help in its solution by sending the floor plan of what they considered to be their most effective treatment of the physical education facilities. Replies were received from thirty-eight firms and twenty-five submitted floor plans. These ranged from small, low cost buildings having a simple auditorium-gymnasium to

buildings costing two to three million dollars with an elaborate array of pools, gymnasiums, and special rooms.

The comments of those who replied, but did not submit plans were: "the school authorities are responsible," "financial conditions limit the architect," "the chief interest is in a large gymnasium for basket ball," "between the eccentricities of the school superintendent and the notions of the board members there seems little opportunity to standardize anything," "we provide what the state department or what the board of education will allow."

NEW SCHOOL BUILDINGS

All of the plans and specifications for the junior and senior high schools that were approved during the two years from January 1927 to December 1928 by the state departments of Massachusetts, New York, New Jersey, and Pennsylvania were drawn from the files and sketches were made to scale of the facilities provided for the physical education program. For Massachusetts this included all buildings except those erected in Boston. For New York State it included all except those planned for cities of more than 50,000 population. All New Jersey buildings were included and all in Pennsylvania except those planned for Pittsburgh and Philadelphia.

This two year period was selected not only because of the unusual activity in schoolhouse construction at that time but also so that sufficient time might be allowed for the construction of the building, the organization of the school program and opinions of the physical education staff to develop regarding the adequacy of the facilities provided in the new building. After the elimination of the plans of buildings with combinations of elementary and secondary departments, those that were mainly additions or alterations to older buildings, those costing less than \$100,000, and those which for lack of funds or for other reasons were not built, there remained eighteen in Massachusetts, thirty-four in New York, twenty in New Jersey and thirty-five in Pennsylvania.

VISITS TO SELECTED SCHOOLS

The state director of physical education in each of the four states was asked to name ten cities in his state where in his opinion the

physical education program was especially effective in meeting the needs of the local community. Personal visits were made to each of these forty cities.¹ The facilities and equipment were checked on a chart based largely on Hart's *Code*;² programs, where available, were secured; classes for both boys and girls were observed; and the opinions of both principals and physical education teachers regarding the advantages and disadvantages of the facilities provided were carefully noted.

¹ See page 171 for list of cities.

² Hart, Frank. *A Standard State School Housing Code* (1924). C. F. Williams and Son, Albany, New York.

Chapter II

TO MEASURE THE PHYSICAL EDUCATION FACILITIES

BEFORE the facilities provided for the physical education program in these one hundred seven buildings could be scored, or rated, it was necessary to set up standards, or criteria, that would be generally recognized as valid by those who have attained leadership in that field. The rather extensive literature regarding the teaching of physical education, i.e., magazine articles, state syllabi, textbooks on the administration of physical education, city building codes and special studies on standards for school buildings, included many references to what should be provided for carrying out an effective program. While there is far from general agreement among these specialists regarding all the facilities that they recommend, there is sufficient agreement to provide a standard which, if followed, would result not only in an increase of opportunity for a more effective program but also, in many cases, would lower the cost of the building.

THE PHYSICAL DIRECTOR'S OFFICE

California Score Card,¹ p. 13.

Instructors' office: In a school having one or two physical education instructors for boys (girls) a single office 10 feet by 12 feet will suffice; adequate light, heat, ventilation and sanitation; conveniently located for supervision of fields, locker room and exercise floor; showers, dressing room and toilet facilities for instructors; bookcase for department library; instructors' desks, cupboard; drawers; files; chairs; lockers; mirror.

Harrison and Dobbin, *New York City Standards*.²

Size—about $\frac{1}{3}$ class room unit. Location—near entrance to gymnasium.

¹ California State Department of Education. *Score Card for Evaluating Physical Education Programs*, Neilson, N. P., 1931.

² Harrison and Dobbin, *New York City Standards*. "School Buildings of Today and Tomorrow."

Purpose—headquarters for pupils' physical training records. Equipment consists of desks, chairs, files. In or near the administration office is a small storage closet for gymnasium supplies.

Hart,¹ *Code*, p. 163.

Gymnasiums shall have the following auxiliary rooms: Directors' office with dressing room and shower bath.

Nash,² *Administration*, p. 249.

A small 8 by 10 foot room should be provided for each physical director together with an outer office for the general public and students. The offices should be conveniently located from the standpoint of supervision, service units, gymnasium floor and athletic fields. It should be equipped with shower and toilet facilities for instructors, desks, bookcases, files, chairs and closets for equipment and supplies.

N.E.A. Committee,³ p. 153.

The office for the physical director is placed where it has command of the entrance to the locker room and ready access to the shower room.

Strayer and Engelhardt,⁴ *Standards*, p. 72.

The efficient administration of the physical training department depends in large measure upon the location of the offices of the physical directors in relation to the rest of the rooms of the department. The offices should be easily accessible to the gymnasium, dressing room, examining room and athletic field. Should be so located as to permit view of the gymnasium floor from the director's office. Equipment should consist of instructor's desk, instructor's and visitor's chairs, filing cabinet, bookcase, first aid cabinet and cabinet for storage of basket balls and other similar gymnasium equipment. Provision should also be made for locker and shower in lavatory for physical director.

Williams and Brownell,⁵ *Administration of Health and Physical Education*, p. 347.

Efficient administration of the physical education department depends, in a large measure, upon the proper location and equipment of office facilities. Many directors of physical education agree that offices should be situated between the gymnasium and locker rooms in such a manner that effective supervision of these areas is facilitated.

The lack of agreement shown above regarding the location and size of the office for the physical director was reflected in these plans.

¹ Hart, Frank. *A Standard State School Housing Code*. 1924.

² Nash, Jay B. *The Administration of Physical Education*. 1931.

³ National Educational Association. *Report of Committee on School House Planning*.

1925.

⁴ Strayer and Engelhardt. *Standards for High School Buildings*. 1924.

⁵ Williams and Brownell. *The Administration of Health and Physical Education*. 1934.

Three schools in Massachusetts, seven in New York, two in New Jersey and twelve in Pennsylvania made no provision for the director.

In but one Massachusetts building, Rockland, was the office placed adjacent to both the gymnasium and the locker room. Similar planning is shown in Granville, New York, as well as Great Neck, Kenmore, Ticonderoga. This was also true in seven New Jersey schools: Bridgeton, Fort Lee, Milburn, North Plainfield, Princeton, Roselle and Union, and five Pennsylvania buildings: Altoona, senior and junior, Lancaster West End, Scranton and Stroudsburg.

TABLE I
Location of Physical Director's Office

	ADJACENT		OTHER LOCATIONS
	GYMNASIUM AND LOCKERS	GYMNA- SIUM	
	ADJACENT LOCKERS	ADJACENT LOCKERS	
Masachusetts	1	6	2
New York	4	7	5
New Jersey	7	4	5
Pennsylvania	5	7	8

In the above table other locations include under the bleachers (with no view of the gymnasium floor) the anteroom of the auditorium-stage, across the corridor, under the gymnasium, at the foot of the stairs leading to the locker room, or any place large enough to place a desk. Several were without outside windows, more were unprovided with shower, toilet or dressing space.

The range of sizes of the rooms provided for the physical director shows the confusion although the median width and length approach closely the standards set by the writers in this field.

The table reads as follows: In one of the New York and one of the Pennsylvania schools the office was between six and seven feet wide.

EXAMINATION ROOM

California Score Card, p. 13.

Health unit rooms. This unit should include one or more rooms to be used for first aid, physical examination, personal health conferences, and by physician, dentist and nurse. One room may serve all these purposes

TABLE II

Width and Length of the Office for the Physical Director

WIDTH IN FEET	MASS. N.Y. N.J. PA. ALL					LENGTH IN FEET					MASS. N.Y. N.J. PA. ALL
	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	
6-7	0	1	0	1	2	8-9	1	2	1	0	4
8-9	5	6	4	6	21	10-11	5	4	1	4	14
10-11	7	13	6	5	31	12-13	2	5	4	8	19
12-13	2	5	4	6	17	14-15	1	4	2	1	8
14-15	0	0	3	3	6	16-17	2	6	3	5	16
16-17	0	2	1	2	5	18-19	3	1	1	1	6
18-19	0	0	0	0	0	20-21	0	1	1	0	2
20-21	0	0	0	0	0	22-23	0	2	2	3	7
22-23	1	0	0	0	1	24-25	1	2	1	0	4
24-25	0	0	0	0	0	26-27	0	0	0	1	1
Median	10	10	10	12	10	32-33	0	0	2	0	2
						Median	12	14	16	12	14

up to an enrollment of 500 boys (girls). Minimum length of examination room 22 feet. Adequate light, heat, ventilation and sanitation. Equipped with single hospital bed, hot and cold water, first aid supplies, chairs, desk, sink, sitz tub, eye chart, full length mirrors, one or more folding screens, files, table, toilet facilities adjoining, closet, cabinets.

New York City Standards, p. 148.

Size about 12 feet by 20 feet. Location—adjoining corrective training room and near the locker and emergency room. Floor—linoleum. Dressing booth—these can be formed by folding screens set up along the wall. Equipment includes a wash basin, a full length two fold mirror hinged to the wall, stadiometers, grip dynaurometers, schematographs, blood pressure gauges, wet spirometers, pedograph machines, stethoscopes and audiometers.

Strayer and Engelhardt, *Standards*, p. 72.

Should be located in direct connection with each physical director's office, also connected with the locker room if possible so that students may be provided for without providing separate dressing rooms. Equipment should consist of scales, lounge, rest chairs, first aid cabinet, and all equipment necessary for physical education.

In but two of these one hundred seven buildings was special provision made for examinations in connection with the physical education department. Springfield provides a room 12 feet by 12 feet

adjoining the office of the boys' director and one 10 feet by 10 feet adjoining the office of the girls' director. Each has 20 per cent outside light. In Lancaster East each director's office has an examination room 10 feet by 12 feet adjoining it with overhead lighting.

GYMNASIUMS

NUMBER OF THE GYMNASIUMS

California Score Card, p. 13.

Exercise Floor—Minimum sizes should be as follows: Boys enrolled one hundred to five hundred—width fifty feet, length eighty-five feet. Boys enrolled five hundred one to nine hundred—width ninety feet, length ninety feet; sliding partitions not recommended.

Department of Superintendents, *Sixth Year Book*,¹ p. 458.

In order to accommodate many classes it is a question of number of gymnasiums rather than size, a large gymnasium divisible into two being less desirable than two separate gymnasiums.

Jallade,² *American School and University*, p. 179.

It is better to have two gymnasiums 60 by 80 feet rather than one 80 by 120, and it might be better still to have one 40 by 60 and another connected to this one 70 by 90.

Keene,³ *Physical Welfare of the School Child*, p. 36.

It should be the aim to provide one gymnasium for each 500 pupils enrolled in the school.

Nash, *The Administration of Physical Education*, p. 213.

From the standpoint of public school use the problem is the number of gymnasiums for a large school rather than size.

N.E.A. Committee, p. 151.

In a school of nine hundred pupils requiring two periods of gymnasium work—two gymnasiums are highly desirable.

New York City Standards, p. 147.

The combined gymnasiums must accommodate at all times one-seventh of the seating capacity of the building. The required floor area of the gymnasium in square feet is therefore seating capacity divided by 7 and multiplied by 30.

Ready,⁴ *American School and University*, p. 239.

If the total enrollment is more than 700 there should be two gymnasiums, one especially equipped for girls and one for boys.

¹ Department of Superintendents. *Sixth Year Book*. 1928.

² Jallade. *American School and University Year Book*. 1928-29.

³ Keene, Charles H. *The Physical Welfare of the School Child*. 1929.

⁴ Ready, Marie M. *American School and University Year Book*. 1931-32.

Strayer and Engelhardt, *Standards*, p. 70.

When enrollments in high school are planned above 800, separate gymnasiums for boys and girls should be provided. Two gymnasiums may even be necessary in schools from 500 to 700 depending upon the kind of health program which is being advanced.

Williams and Brownell, *Administration of Health and Physical Education*, p. 338.

In secondary schools it is essential that separate gymnasiums be provided for boys and girls. Indeed no class enrollment, even of the same sex, should exceed sixty to seventy-five pupils. Entirely separate gymnasiums are preferable to any plan of dividing the large space into smaller areas.

All authorities quoted above favor two gymnasiums rather than one in the larger schools. Large, as interpreted in this case, ranges from 300 plus (California Score Card) to 900 (N.E.A. Committee). Of the eighteen Massachusetts buildings included in the study only Agawam (enrollment 691) and Norwood (enrollment 949) have two gymnasiums. Everett (1300), Salem (1470), Somerville (3026), Springfield (1190), Weymouth (1046), and Westfield (1170) have but a single gymnasium for an enrollment of over a thousand. Two of the thirty-four New York buildings, Bronxville (292), and White Plains (1450) have two gymnasiums, while Ballston Spa (1055), Canandaigua (1250), Floral Park (1200), Great Neck (1039), Valley Stream (1075), have but one. In New Jersey three of the twenty buildings, Bridgeton (1541), Elizabeth (1332), Milburn (600), have two gymnasiums, and two with enrollments over a thousand, Roselle (1150), and Teaneck (1400), have but one. In Pennsylvania, four of the thirty-five buildings, Altoona Senior (2242), Altoona West Junior (1960), Erie (1200), Scranton (2971), have two gymnasiums and Allentown (2344), Haverford (1100), Lancaster East (1070), Lancaster West (1300), New Castle (1955), Sharon (1250), Upper Darby (1800) have but one.

LOCATION OF THE GYMNASIUMS

Hart, *A Standard State School Housing Code*, Sec. 169.

Gymnasiums shall be located on the ground floor. The floor shall not be more than two feet below grade.

Nash, *Administration*, p. 214.

When possible the gymnasium should be in a separate unit.

N.E.A. Committee, p. 147.

The gymnasium must be located so as to be a "hall of health." The prime essentials are direct sunlight and a maximum of natural cross ventilation. The floor should be above the natural grade to insure dry and sanitary condition, to preserve the life of the wood flooring and to permit the introduction of outside air which will not be laden with the dust and dirt at the ground level.

Placing a gymnasium in an excavation under an auditorium cannot be too strongly condemned. The best location is in a wing, or at one end of the building. Since a direct southern exposure is good for gymnasiums, but not for classrooms a double advantage is secured by placing the gymnasium at the southern end of the building.

Strayer,¹ *American School and University*, p. 226.

To those of us who work in schools it is a commonplace that the two long sides of a gymnasium should be exposed to the light and air. We want the sweep of air and sunlight across the floor. Nevertheless, many buildings have been constructed with one of the long sides of the gymnasium up against some other part of the building. An even less desirable form of gymnasium has been planned as an extension of the stage of the auditorium. We have had buildings planned in which the gymnasium has been sunk in a hole in the ground. This sort of facility is not good for children and is of course no more available for community use.

From the standpoint both of the school and of the recreation program for the community the gymnasium should be built at the end of a wing or in some other manner in a semi-detached position with respect to the rest of the building.

Strayer and Engelhardt, *Standards*.

The gymnasium is preferably located where the room may be flooded with sunlight. The perfect location is on the ground level and at a point which permits of correlation of work on the athletic field with the use of the gymnasium and its auxiliary facilities. Because of the desirability of using both gymnasium and auditorium for a large part of the school day it is not advisable to plan the gymnasium as a stage for the auditorium.

Williams and Brownell, *Administration of Health and Physical Education*, p. 337.

The best place for the gymnasium is in a wing of the building and on the ground floor. While a direct southern exposure is unsuitable for classrooms it is desirable for gymnasiums.

All of these authorities agree upon a ground floor location, direct sunlight and cross ventilation. All condemn an excavation under the

¹ Strayer. *American School and University*. 1930-31.

auditorium, or the gymnasium as stage for the auditorium, and the auditorium-gymnasium is approved only for small enrollments.

In the Massachusetts buildings Agawam has a gymnasium thirteen feet below grade; Whitman and Rockland are eight feet below the grade level. Agawam, Revere, Rockland, Sharon, Watertown, and Whitman are under the auditorium. In Malden (enrollment 700), and Salem (1470), the gymnasium serves as the auditorium-stage; Chicopee (750) and Weymouth (1046) have auditorium-gymnasium.

In New York, the Ballston Spa gymnasium is nineteen feet below grade, Middleville thirteen feet, Lackawanna is ten feet below, Ticonderoga and Waterloo eight feet below. Ballston Spa, Conastota, Horseheads, Lackawanna, Liverpool, Millerton, Plattsburg, Ticonderoga, Trumansburg, and Waterloo have the gymnasium under the auditorium. Addison (550), Jamestown (554), and Kings Park (386) have the gymnasium-stage arrangement while Belmont (373) and Middleville (291) have the combination auditorium-gymnasium.

In New Jersey, at Mays Landing the gymnasium is ten feet below grade and under the auditorium. At Bridgeton it is nine feet below grade at the bottom of a court. North Plainfield (720) and Teaneck (1400) have the gymnasium as a stage and Keyport (348) has the auditorium-gymnasium.

In Pennsylvania the state building laws require that a school building more than two stories high must be of first class construction. Possibly for this reason more of the building was placed below grade level in the Pennsylvania schools than was the case in the other three states studied. The gymnasium in the Cumberland building is sixteen feet below the grade level, Birdsboro fourteen feet, Glassport twelve, Spring City twelve, Stroudsburg nine, Altoona eight. All of these, except Altoona, which has another gymnasium above it, are under the auditorium. The buildings at Duquesne, Ebensburg, Emlenton, Lancaster East and West, North Braddock, Sharon and Spring Township also have the gymnasium under the auditorium. Four (Danville, Hempfield Township, Manheim Township and North Braddock) have the gymnasium-stage plan and

three, Berwyn (500), Elizabethtown (500), and College Hill (171) have the combination auditorium-gymnasium. Ease of planning and following precedent located the gymnasium in a hole in the ground in more than a third of these new buildings and ten per cent have the gymnasium stage-arrangement.

SIZE OF THE GYMNASIUM

California Score Card, p. 13.

Exercise Floor. Minimum sizes should be as follows:

Girls (Boys)			
Enrolled	Width	Length	Height
0—150	46'	80'	18'
151—500	50'	85'	20'
501—900	60'	90'	22'
901—over	70'	100'	22'

Hart, *A Standard State School Housing Code*, Sec. 169.

The minimum dimensions that shall be approved shall be approximately 45 by 75 by 18. Larger areas and greater heights are desirable.

Keene, *Physical Welfare of the Child*, p. 36.

For elementary and junior high schools the gymnasium should be at least 40 by 60 in size and for senior high schools at least 60 by 80 feet.

Nash, *Administration*, p. 214.

The range of sizes is indicated in the following: Minimum 45 by 60. Medium 50 by 80. Maximum 60 by 90.

N.E.A. Committee, p. 149.

Before determining the size of the gymnasium to be adopted we must determine the size of the average and maximum classes to be accommodated. In schools in which there would be more than eighty pupils at a time, the gymnasium should be divided into two parts, one for boys and the other for girls, or there should be two gymnasiums.

Strayer and Engelhardt, *Standards*, p. 70.

The gymnasium room may have dimensions of 40 feet by 60 feet. A larger floor space, 50 feet by 80 feet is preferred. The height of gymnasium should be 18 feet under all beams and trestles. Where two gymnasiums are planned it frequently is desirable to so locate them that they may be thrown into one gymnasium for public games.

Williams and Brownell, *Administration of Health and Physical Education*, p. 338.

Forty by sixty feet should be regarded as a minimum. An area 50 feet by 80 feet or even 80 feet by 90 feet is not too large for game program.

The smallest dimensions stated by any of the above authorities are forty feet in width by sixty feet in length with eighteen feet under all beams and trestles.

In most of the buildings these minimum dimensions for length and width were met. In Massachusetts a girls' gymnasium in Agawam was thirty-one feet wide and in Malden the one gymnasium was thirty-six by ninety. In New York, the width at Alexandria Bay was thirty-four feet, Jamestown thirty-eight, and Millerton thirty-five feet. In Teaneck, New Jersey, the gymnasium-stage is thirty-five feet wide, and in Pennsylvania, Avondale, thirty-eight; Cheltenham Township, thirty-eight; Danville, thirty-eight; and Philipsburg, thirty-four, had less than the forty feet minimum.

HEIGHT OF THE GYMNASIUMS

California Score Card, p. 13.

Minimum sizes should be as follows: Enrolled 0-150, height of side wall from floor to beam 18 feet; enrolled 151-500, height 20 feet; enrolled 501-900, height 22 feet.

Hart, *Code*, Sec. 169.

The minimum dimensions that shall be approved where a standard gymnasium is required shall be approximately 45 by 75 by 18. Larger areas and greater heights are desirable.

Jallade, *American School and University*, p. 179.

The height depends upon the length and width of the gymnasium, but the ceiling height should never be less than 20 feet to the bottom of the beams.

Keene, *Physical Welfare of the School Child*, p. 37.

Ceiling height should be from 18 to 22 feet for secondary schools.

Nash, *Administration*, p. 203.

The main room of the gymnasium must be double the height of the usual classroom, p. 233. The range of heights is indicated in the following: Minimum 18 feet. Maximum 22 feet. Advised 20 feet.

N.E.A. Committee, p. 147.

The clear height from the floor to the under side of the girders should be not less than 18 feet. This height is necessary for games and swinging apparatus.

Strayer and Engelhardt, *Standards*, p. 70.

The height of gymnasium should be 18 feet under all beams and trestles. Williams and Brownell, *Administration of Health and Physical Education*, p. 340.

No gymnasium will be satisfactory which is less than 18 feet high.

The tendency of placing the gymnasium under the auditorium lowered the ceiling height in some buildings. Six buildings failed to meet the minimum standard: Revere, Massachusetts, sixteen feet; in New York, Horseheads and Millerton sixteen feet, and Ticonderoga seventeen feet; Bridgeton, New Jersey, seventeen feet, and Emlenton, Pennsylvania, sixteen feet.

LIGHT FOR THE GYMNASIUMS

Hart, *Standard Code*, Sec. 169.

A maximum of sunlight and fresh air shall be sought. The glass area shall not be less than 20 per cent of the floor area. It shall be divided between at least two sides of the room.

Jallade, p. 181.

It would seem that the ideal lighting of a gymnasium would be through skylights, but this is not true. Skylights give a certain amount of leakage due to the constant changes to temperature to which they are subjected. Then there is the admission too of too much sun into the room at the time that additional heat is not required. The ideal light and ventilation is through the side windows and the designer should attempt to bring his window down to the floor.

Keene, *Physical Welfare*, p. 37.

Good lighting, plenty of outdoor windows are essential.

Nash, *Administration*, p. 223.

Windows. The windows should be of the Louvre screened type tinted or equipped with curtains set in grooves, and should be operated by unit control whereby a section of windows can be opened or closed with the turn of a handle. Although there is some advantage in having the window low from the standpoint of light and ventilation it seems to be a greater advantage to have them more than twelve feet from the floor in order to utilize the walls for activities. Skylights have not proven satisfactory. Apparently the solution is no skylight.

N.E.A. Committee, p. 144.

The gymnasium must be a "hall of health" with an abundance of fresh air and sunlight, p. 147. Windows of adequate size must be on at least two opposite sides. The floor should be above the natural grade, p. 134. The importance of flooding with fresh air the lower part of the gymnasium is so great that the windows or at least one side should be brought down to, or nearly to, the floor level.

Strayer and Engelhardt, *Standards*, p. 71.

Natural light. Preferred on the two long sides of the room with a mini-

mum of light at the ends. Overhead lighting in the gymnasium is the least desirable method of lighting.

Williams and Brownell, *Administration of Health and Physical Education*, p. 345.

Whenever possible windows should be inserted in the two long sides of the gymnasium, but not on the ends. The ratio of window space to floor area is the same as for classrooms, i.e., one fourth to one fifth. Skylights are not altogether satisfactory. Windows of the pivot or Louvre type are rapidly supplanting the ordinary casement sash.

All authorities agree upon an abundance of natural light. A glass area of 20 per cent of the floor space, located on the two long sides, without overhead skylights seem to be minimum requirements. In Massachusetts two of the buildings, both by the same architect, Arlington (25% light) and Somerville (30%) exceed these requirements. Three others in Massachusetts, Agawam (with skylight lighting), Rockland and Springfield have 20 per cent with all the others less. Four are far below the standard: Chicopee (5%), Revere (5%), Sharon (7%), Whitman (9%).

In New York, Amenia (24%), Bronxville (25%), Jamestown (25%), and White Plains (40%), exceed the minimum standard. Ballston Spa (6%), Canajoharie (7%), Canastota (4%), Horseheads (3%), Islip (8%), Millerton (8%), and Trumansburg (8%) are far below.

In New Jersey, Milburn (25%), River Edge (22%), and Teaneck (25%), contrast with North Plainfield (7%) with skylights.

In Pennsylvania but two buildings of the thirty-five, Allentown (22%), Avondale (25%), exceeded the minimum standard while eleven had less than 10 per cent with six of the eleven falling below 5 per cent.

The recommendation that the windows be on the two long sides of the gymnasium was quite generally ignored. Arlington, Rockland, and Somerville in Massachusetts, Bronxville, Granville, Islip, Lackawanna and White Plains in New York, and Dumont, Elizabeth, Fort Lee and Milburn in New Jersey have the light about evenly divided between the two sides. The only Pennsylvania buildings with this window arrangement were Allentown and Avondale, which, as noted

above, were the only Pennsylvania buildings that exceeded the minimum standard for light.

WALLS OF THE GYMNASIUMS

California Score Card, p. 13.

Walls smooth; acoustics good.

Jallade, *American School and University* (1928-29), p. 182.

These should be of an indestructible material—by that I mean anything but plaster. It may be brick—either face brick or common brick. It is a question of usage. If the gymnasium is to be used as an auditorium then the walls should be of a soft brick so as to absorb the sound or the entire walls from floor to ceiling may be covered with oak flooring on the basis that anything you can walk on makes a good wall surface.

Nash, *Administration*, p. 214.

The walls of the gymnasium should be of impervious glazed brick or tile. Two important points should be kept in mind—the material should not crumble when used for hand ball, tennis serves, squash and target throws and should be sound absorbing.

Strayer and Engelhardt, *Standards*, p. 71.

Walls. Glazed brick wainscoting, well pointed. The upper part of the walls may be of plain brick or any other standard construction. All walls should have a minimum of projections. All radiation should be recessed thus making a smooth wall surface possible for players as well as the thrown ball. Certain wall surfaces should be prepared for hand ball and other similar wall games.

Williams and Brownell, *Administration of Health and Physical Education*, p. 342.

It is essential that the walls of the gymnasium be hard and smooth up to a height of from 10 to 12 feet from the floor. Above the 10 or 12 foot level the wall should be constructed of some material which will decrease noise and sound reverberation.

In one school (Elizabeth) the specifications called for “cement plaster wainscot sand finished, plaster walls”; in two, Ticonderoga and Liverpool, oak wainscot was specified; two, Spring City, and Rockland, used the unsurfaced concrete; two, Valley Stream and White Plains, have glazed tile walls; five, Altoona, Arlington, Scranton, Frankfort, and Hamilton Township, specified brick wainscot with plaster walls. The other ninety-five buildings used brick walls for the gymnasium with a salt glazed brick wainscot specified for ten of them.

FLOORS OF THE GYMNASIUM

California Score Card.

Maple or other hardwood floor.

Jallade, p. 182.

Finished flooring should be set up on sleepers on top of an under floor. There should be a soft felt between the under floor and the finished floor. The upper floor surface should be maple.

Nash, *Administration*, p. 217.

There seems to be some difference of opinion as to whether pine blocks on end, cork, or hard maple furnish the best surfacing. From the standpoint of the gymnasium activities probably cork is the best. Considering the floor from the standpoint of intensive use not only for the strenuous activities but for the evening recreation groups probably hard maple is best. This should consist of an inch and a quarter maple laid over tar paper and common pine seven-eighths of an inch laid diagonally. The floors should be treated with fire proof liquid after which they should be saturated with boiled linseed oil. They should then be brushed with the grain until all the oil has been removed from the surface. The floors should be polished with light non-oil wax. It is practical to cover the floor with a large canvas for banquets and social affairs other than dancing.

New York City Standards.

Wood blocks on end or maple with under floor on sleepers. Steel angle brace secured to the wall provides a wide expansion joint and prevents buckling.

Strayer and Engelhardt, *Standards*, p. 70.

A hard maple floor of picked $1\frac{1}{2}$ inch tongue and groove of $\frac{3}{4}$ inch thickness laid over another floor of hard pine that has been laid diagonally and blind nailed and oiled makes the best kind. Noise proofing material of standard quality should be built in the under structure, also such provision as will reduce vibration to the rest of the building to a minimum.

Williams and Brownell, *Administration of Health and Physical Education*, p. 341.

Hard maple boards one and one quarter inches in width and three quarters of an inch in thickness, tongued and grooved and fastened to a sub-floor laid diagonally. The sub-floor is attached to felt lined screeds or strips which are anchored to a concrete base.

A mastic floor at Horseheads, a beech block floor in Lackawanna and pine blocks on end in Arlington, Quincy, Bronxville, Bridgeton,

Altoona and Upper Darby were the only exceptions to the almost universal one of maple floor with an under floor on sleepers. Several also specified that a layer of felt should be between the two floors.

BLEACHERS OF THE GYMNASIUM

California Score Card, p. 13.

Seating arrangements in gymnasium for one-half of student body enrollment (as a minimum). Seats permanent or temporary with temporary preferred; line of sight correct; safe; clean; without splinters.

Hart, *School Housing Code*, Sec. 169.

Where spectators' galleries are not provided the gymnasium shall be wide enough to provide for a standard basket ball court at the same time allowing space on the two sides of the room for movable tiered seats.

Jallade, p. 180.

Spectators' galleries when up in the air—say over 10 feet—do not allow (except for the front row) of a proper vision of the playing floor space. The ideal gallery is one around the gymnasium four feet wide so there is one man sitting and one man standing. There is one other method which is of course still better, and that is, bleachers which start level with the floor.

Nash, *Administration*, p. 224.

Where indoor bleachers are a necessity an additional space 15 feet wide should be required in the length of the gymnasium. Movable bleachers have been satisfactory but from the standpoint of safety and convenience bleachers which fold up to the wall are much better.

N.E.A. Committee, p. 145.

Ample provision for spectators to view exercises, exhibitions and games is desirable in every gymnasium, large or small. Such spaces may be provided (a) by removable bleachers placed on the floor when needed, (b) by galleries, (c) by the articulating auditorium and gymnasium or (d) by a lifting tier of seats. For a basket ball game the most desirable location for spectators is in bleachers near the floor and on either or both of the long sides of the court. Nineteen to twenty-two inches should be added to the width of the gymnasium for each row of spectators.

Strayer and Engelhardt, *Standards*, p. 72.

The planning of seating space for spectators at public games should be given very careful attention. Where two gymnasiums may be thrown into one, the location of the spectators' gallery so that the galleries of the gymnasiums may be combined into one is desirable. Where the gymnasiums are planned separately, one gymnasium may be provided with a spectators' gallery for the public games. Additional seating space should be planned when possible upon the main floor of the gymnasium.

In planning spectators' galleries durable fire proof construction is preferred.

Williams and Brownell, *Administration of Health and Physical Education*, p. 337 and p. 343.

The auditorium-gymnasium is at best a makeshift arrangement and seldom proves satisfactory. The same may be said for the combination stage-gymnasium. Some provision must be made for spectators in most gymnasiums. Removable bleachers are commonly used. Where townspeople have learned to regard the gymnasium as a community center it is almost imperative that some kind of built-in bleachers be installed.

The greatest possible divergence is seen in respect to the bleacher space provided in these buildings. Eight of the eighteen in Massachusetts, ten of the thirty-four in New York, two of the twenty in New Jersey and five of the thirty-five in Pennsylvania made no provision for bleachers on the plans. (This lack of provision seemed to have no relationship to the enrollment of the school, or the cost of the building except that all schools devoting over 25 per cent of the cubic contents of the building to the physical education program had large provision for permanent bleachers.) At the other extreme are Allentown, Pennsylvania, with bleacher area two and a half times that of the space allotted to the gymnasium floor itself, and North Braddock with one and a half times as much space for bleachers as for playing space. At Stroudsburg, and Sharon in Pennsylvania, Ballston, Islip and Ticonderoga in New York the space for bleachers equaled the space given to the gymnasium. As pointed out in the description of the location of the gymnasium, two buildings in Massachusetts, three in New York, two in New Jersey and four in Pennsylvania have the gymnasiums as the stage of the auditorium. It is obvious that in these eleven buildings the auditorium might serve as the bleachers for the gymnasium.

Of the seventy schools that made specific provision for bleachers, exclusive of the use of the auditorium for this purpose, Massachusetts provided areas that ranged from 6 per cent to 55 per cent of the playing floor area, with a median of 25 per cent. In New Jersey these areas ranged from 15 per cent to 100 per cent with a median of 30 per cent. Pennsylvania and New York both had the same median, 40 per cent of the area of the playing floor, but in the former the range was from 6 per cent to 250 per cent, and in the

latter from 15 per cent to 100 per cent. For the four states combined, the range, 6 per cent to 250 per cent, was almost the same as for Pennsylvania with the same median of 40.

Permanent concrete construction predominated, with or without plank slabs for seats. One variation, found in two buildings in Pennsylvania, was an arrangement where the wall between the gymnasium and the adjacent corridor had five rows of seats placed on the gymnasium side. This wall was hinged at the bottom so that it could be dropped back against a supporting angle on the far wall of the corridor which brought the attached seats into a position to be used as bleachers for the entire length of the gymnasium.

In thirty-six of the seventy schools that provided bleacher space it was planned that the lowest seat be near the level of the playing floor and the space under the bleachers was utilized only when the bleachers were of sufficient width to make this possible. In the others, the utilization of the space under the bleachers seemed to have had more consideration than making provision for spectators to view the exercises and games. One architect compromised by having the first row of seats start at four feet. In three, the first row was at five feet and for two others at six. In six schools the balcony wall started at eight feet, one at nine feet, eleven at ten feet, with the others one story above the playing floor. The contrast between the different states was marked. Fourteen of the Pennsylvania buildings and fifteen of those in New York started the bleachers from the playing floor level. Six in New Jersey and one in Massachusetts made this provision.

CORRECTIVE GYMNASIUMS

California Score Card, p. 13.

Size approximately 20 feet by 30 feet, minimum height 12 feet, adequate light, heat, ventilation and sanitation, arrangement good; accessible. The equipment should include low and high plinths, stall bars, stools, body mats 3 by 6, mirror 6 by 4, weighing scale, horizontal ladder, balance beam.

Nash, *Administration*, p. 288.

Room for individual activities. This room should be approximately 20 by 30 feet with a height of 10 to 12 feet. Adequate heat, light and ventilation should be provided. It should be equipped with stall bars, mats of

various sizes, high ladder, flying rings, a few wands, Indian clubs and dumbbells and large full length mirror.

New York City Standards, p. 146.

The corrective training room equals one and one-half classrooms adjoining the physical examining room. Equipment—Scales, pulley weights, plinths, horizontal bars, mats, stall bars, bar benches, flying rings, dumb bells, large triple mirror. Wall panel smooth varnished wood 10 feet long, 3 feet and 6 inches high.

Strayer and Engelhardt, *Standards*, p. 72.

Preferably approximately 25 feet by 50 feet used for individual student work or for the work of smaller groups needing special corrective attention. Adequately lighted and ventilated and located as a part of the physical education unit.

Williams and Brownell, *Administration of Health and Physical Education*, p. 346.

In many school systems an attempt is made to correct individual postural defects through prescribed exercises. For this purpose one or more small gymnasiums are provided each about 25 by 50 feet in size. It is recommended that these rooms be located adjacent to the large gymnasiums and offices.

While all of the quoted authorities agree upon the desirability of having a well lighted specially equipped room for special groups few of these communities felt the need of a corrective room, if one may judge from an examination of the plans. Aside from two rooms in Teaneck, New Jersey, each 27 by 46 feet and lighted by two windows 5½ feet by 7½ feet; one in Great Neck, New York, 22 by 38 with 12 per cent light from a court, and one room adjoining the girls' gymnasium in White Plains, 23 feet by 30 feet, with 20 per cent light, no special provision was made for a corrective program in planning these one hundred seven buildings.

APPARATUS ROOM OF THE GYMNASIUMS

California Score Card, p. 13.

Separate facilities for storing temporary bleachers, piano, and apparatus convenient to the main exercise floor.

Nash, *Administration*, p. 228.

A small room adjacent to the gymnasium floor is usually essential. It should have a large opening onto the main floor.

N.E.A. Committee, p. 149.

Adjacent to each gymnasium and on the same floor level there should be

a good sized room with wide sliding doors for ease of access in storing apparatus. This room should also receive the portable bleachers when not in use.

Strayer and Engelhardt, *Standards*, p. 39.

There should be a storage room adjoining the gymnasium with a minimum of approximately 200 square feet floor area for keeping the large pieces of apparatus during match games and the portable bleachers at other times.

Williams and Brownell, *Administration of Health and Physical Education*, p. 345.

Store rooms for apparatus and equipment are to be located adjacent to the gymnasium and on the same floor level. The minimum size of approximately 200 square feet permits the storage of apparatus and a limited number of portable bleachers.

The above standards agree upon the need for a storage room adjacent to the gymnasium and a separate room or space for portable bleachers is suggested. The need for storage space was overlooked entirely by many of the architects for these one hundred seven buildings. Seven of the eighteen in Massachusetts made no special provision for the storage of apparatus or bleachers. This was also true for half of the New York buildings, six of the twenty buildings in New Jersey, and fifteen of the thirty-five in Pennsylvania. On the other hand three in Massachusetts (Chicopee, Salem and Weymouth) provided separate, well lighted rooms for apparatus and bleacher storage adjacent to the gymnasium. Equally adequate provision was made at Briar Cliff, Bronxville, and Jamestown in New York, Fort Lee in New Jersey, and Haverford Township and Lancaster in Pennsylvania.

DRESSING ROOMS OF THE GYMNASIUMS

California Score Card, p. 14.

Dressing Room. Area to be used for dressing purposes: Large enough to provide space (exclusive of lockers) equal to 12 square feet per pupil for the largest number dressing in any one class period. Adequate light, heat, ventilation and sanitation; floor at or above ground level. Dressing room not to be placed under other floor areas unless, for unilateral lighting, the width of the room is not over twice the distance from the window tops to the floor; dressing room built in one story and with skylights in ceiling preferred.

Hart, *Code*, Sec. 169.

Accessory Rooms, Locker Rooms, Shower Rooms, and Toilets for each sex in proportion to the number of pupils to be accommodated at any one time.

Jallade, p. 183.

The design of the locker room will always be a matter of controversy. There are nevertheless some fixed principles that must be observed. First, there is light, and for the purpose of economy the rows of lockers should be perpendicular to the wall so that the lights illuminate the aisles. Second, the ceiling must be high enough so that the artificial illumination, which should be close to the ceiling, can shine over the whole room. Third, it should be possible to shut off the room so as not to have any drafts or currents of air to deposit dust on the clothes. Fourth, the room should be so arranged that the lockers can be superheated at night so that the clothes that are left in them are dry the next morning.

The ideal arrangement is one in which the floor is built up under and to the edge of the locker, where there is a steam pipe under the locker, and where the ventilation is through the locker from the bottom up. There is the matter of materials.—The best floor is cork, then tile, next cement. The walls are best when made of brick.

Nash, *Administration*, p. 242.

A number of questions of policy must be considered relative to the type of lockers, showers and dressing units. The unit should have adequate light, heat and ventilation. The floors should be of such material that they can be hosed. A total of twelve square feet per child should be allowed for the peak load. It should be noted that approximately the same amount of square foot space is necessary for the service units as for the indoor gymnasium.

New York Standards.

It is useless to provide great gymnasiums unless the locker and circulation facilities are adequate and in proper relation to the gymnasiums.

Strayer and Engelhardt, *Standards*, p. 73.

Dressing rooms permitting of changes into athletic and gymnasium garments should be provided adjoining each gymnasium. These rooms should include provision for regular classes as well as for visiting teams. All of these rooms should be so located that passage to the gymnasium floor is made directly. Adequate lighting and ventilation of these rooms are highly essential.

Williams and Brownell, *Administration of Health and Physical Education*, p. 349.

A modern type of construction inserts the offices of the staff between the gymnasium and locker room. Ceilings should be at least 10 to 12 feet

above the floor. Smooth walls of face brick are best, windows so placed that sunlight may reach even the remotest corner of the room for a portion of the day at least.

The above standards agree upon adequate space (12 square feet per pupil in largest class) close relation to gymnasium, adequate light and ventilation, and cork, tile, or cement floor.

In approximately half of these buildings the dressing rooms were placed either on the ends or the side of the gymnasium although the difference in the several states was evident.

TABLE III
*Placement of Locker Room in Relation
to Gymnasium*

	MASS.	N.Y.	N.J.	PA.	ALL
Adjacent gymnasium	9	18	15	15	57
Under gymnasium	7	9	3	9	28
Under bleachers	1	2	0	6	9
Across corridor	1	5	2	5	13

In Pennsylvania more than in any of the states the dressing rooms were placed under the gymnasium or under the bleachers. The ratio between the floor area and window area in the dressing rooms adjoining the gymnasium ranged from no provision at all for outside windows to 16 per cent light, with a median of 8 per cent. For those under the bleachers or under the gymnasium itself the range was from no windows at all to 12 per cent light, with a median of five per cent.

With few exceptions the floors in the dressing rooms were of cement.

So many different groupings and combinations of shower space, dressing space and locker space for girls were found in these buildings that it was impracticable to attempt to determine with any degree of accuracy the square feet per pupil area for each so far as the girls were concerned. For the boys, however, the gang type of shower was found in all buildings (if one may accurately describe a total of two as a gang) and it was thought that a description of the variation in the areas provided for the boys might be sufficient picture for the whole.

In the Massachusetts buildings five furnished less than ten square feet per pupil for the combined locker and dressing room space, while one had thirty-nine square feet. In New York three buildings, Alexandria Bay, Canajoharie and Kenmore, allowed but three square feet per pupil in the boys' dressing room and four buildings, Briar Cliff, Nyack, Watertown and White Plains, had thirty-three or more square feet. In New Jersey the range was from three square feet in Pleasantville and four square feet in Fort Lee to thirty-two in Camden and forty in River Edge. In Pennsylvania five square feet in Spring Township and six square feet in Birdsboro and Philipsburg were at one end with forty-three in Berwyn and thirty-six in Erie at the other extreme. The median for Massachusetts was fifteen square feet, for New York twelve square feet, for New Jersey eleven square feet, and for Pennsylvania fourteen square feet. All four medians approached the standard set up by our authorities of twelve square feet of dressing space exclusive of that taken up by lockers, but in all four states some buildings greatly handicapped the physical education program because of cramped quarters while others went to the other extreme of providing two and three times as much space as is suggested by any of the standards set up. The frequency distribution of the areas provided in each of these four states appears in Table IV.

TABLE IV
*Total Area Provided for Lockers and Dressing Rooms
for Boys Divided by the Number of
Boys in the Largest Class*

SQUARE FEET	MASS.	N.Y.	N.J.	PA.
0—4	0	3	2	0
5—9	5	7	5	10
10—14	4	14	5	10
15—19	3	2	4	5
20—24	2	2	0	3
25—29	3	2	2	2
30—34	0	3	1	4
35—39	1	1	1	1
40—45	0	0	0	0
Median	15	12	11	14

SHOWERS OF THE GYMNASIUMS

California Score Card, p. 14.

Boys: Size of room to vary with enrollment; 14 square feet of floor area for each shower head. One shower head for each four boys in largest enrollment. Tiled floor area and walls tiled 4 feet 9 inches high. Adequate light, heat, ventilation, sanitation, and drainage; liquid soap from central container from nickel plated wall stubs, shower heads and controls exposed; piping behind walls, fixed shower heads close to wall placed at three levels at chin height; overhead type not desirable, individual hot and cold mixing valve at each shower; drying room between shower and dressing room.

Girls: Same as for boys. A group shower room to accommodate at least two-thirds of the number of girls in the period having the largest enrollment. Individual shower rooms may be built to accommodate the other one-third. These should have marble or terrazzo walls not to exceed 4 feet 9 inches in height, tiled floor and sufficient drainage.

Jallade, p. 184.

There should be no pipes in the shower room. The floor should be of a basket weave tile to prevent slipping. The drainage of the floor should be towards the wall. The shower heads should be offset from the valves. The soap dish should be below the shower heads so that it is constantly being washed out. The radiators should be brass. There should be no pipes going through the floor. The window frames and sash should be copper covered.

Nash, p. 245.

Boys' showers are usually arranged in batteries without partitions and with individual control. Great care should be taken to have large outlets so that the water will not back up. Nine to twelve square feet should be allowed for each shower. The spray should strike at shoulder height and the heads should be firm. Liquid soap should be supplied from built-in fixtures. All pipes should be concealed but in easy access for repairs.

Girls' showers. It has been held in the past that girls demand individual showers either next to their dressing booths or in a special shower room. These are very expensive both from the standpoint of original cost and from that of space. There is a growing feeling that closed shower booths are not necessary and there is considerable evidence that girls prefer open showers and choose to dress in front of their lockers. Shower heads should be so placed to strike the bather at shoulder height. In the light of the present trend it would seem advisable to have 20 per cent of the showers of the booth type and 80 per cent open.

The formula relative to number of showers needed is as follows:

<i>Boys, peak load—10%</i>	<i>Girls, peak load—20%</i>
3	2

N.E.A. Committee, p. 152.

Girls: Dressing booths are placed three each side of a narrow aisle and screened by curtains. Each dressing booth 3 feet by 3 feet by 11 feet is provided with a long seat 12 inches wide and two cornerwise lockers. Six dressing booths use one short, narrow passageway to the shower booth. The privacy of the passageway is increased by a curtain at the end screening it from the main aisle. There should be one shower for each three girls. All shower heads for girls should be placed at shoulder height.

Boys: The showers for boys should be placed in a room without booths and be operated under gang control. There should be one shower head for every five boys in the largest class.

From some standpoints the ideal arrangement places the accessories on the same floor level as the gymnasium itself. It is possible then to place the offices where the instructors will have control of both the floor and the accessories. This arrangement requires a very large area on a given floor and generally results in giving the gymnasium a basement location.

New York City Standards, p. 177.

Boys' Shower. Marble wainscot or walls of white enamel brick. Shower heads three feet apart along the walls. Two showers equipped with pupil control valve. Remainder by teacher control.

Girls. Two dressing booths for each shower placed on opposite sides. Each booth to contain two lockers for care of clothing.

Strayer and Engelhardt, *Standards*, p. 35.

Showers easy of access from gymnasium, swimming pool and athletic field, number depending upon probable size of gymnasium classes.

For girls: Individual side showers in nests of compartments consisting of shower space, drying space, dressing space, and locker space.

For boys: Individual side showers in separate stalls with drying space adjacent to general locker room. All valves should be of the automatically operative type. Adequate planning will consider proper drainage, non-slip floors, adequate natural and artificial lighting and proper seclusion for shower rooms.

Williams and Brownell, *Administration of Health and Physical Education*, p. 362.

The locker room and the shower room should be separate but adjacent units. Ground floor, natural light, within easy access to locker rooms, lavatories, gymnasia, and swimming pools. Approximately 12 to 14 square feet of space should be allowed for each shower head, one shower

head for each squad of four, using the largest class as the scheduling basis. Non-slip tile floors, tile walls. Shoulder height shower.

For girls: A definite trend exists towards the adoption of the gang shower plan recommended for boys.

For the physical education facilities described up to this point there is close agreement between the several authorities who have set up recommended standards. For the showers, however, especially those for girls, there is little agreement either in regard to the number that should be installed or their proper arrangement in relation to the dressing rooms. The writers do agree that the shower heads for girls should be placed at shoulder height and those who mention the height for the boys' showers all recommend the shoulder height for them also.

Location of Shower Head.—In the Massachusetts buildings four had the shower heads at shoulder height for boys and five at shoulder height for girls. In the New York buildings three had the shower heads at shoulder height for boys and five had the shoulder height for girls. In New Jersey the difference between the provision for boys and girls was marked: Two for boys and nine for girls were at shoulder height, while in Pennsylvania only one for girls and none for boys was other than overhead.

Number of Showers.—Only three of the quoted authorities specify the number of showers that should be provided. The N.E.A. report says one shower for each five boys and one for each three girls. Nash says one shower for each three boys and one for each two girls, while the *California Score Card*, that recommends gang showers for girls as well as for boys, sets up the ratio of one to four for either boys or girls.

There seemed to be such slight relationship between the number of showers and the size of the physical education classes in these one hundred seven buildings that scatter diagrams were made for each state for both boys and girls showing the distribution of showers in relation to the size of the classes. The diagram for girls' classes in Pennsylvania showing a correlation of .06 is given on page 38.

In the eighteen Massachusetts buildings a class of seventy girls at Watertown with six showers and a class of eighty-five in Somerville with thirty showers indicate the range in that state. For the

thirty-four New York State buildings, Watertown junior high with two showers for girls and classes of fifty, Jamestown with three showers for classes of sixty, or Kings Park with two showers for classes of forty are at one end of the scale, and White Plains with twenty-four showers for the largest class of seventy-eight and Kenmore with twenty-two showers for the largest class of eighty-six are at the other. In the twenty New Jersey buildings three showers for girls at West Orange for a class of seventy-five, or one shower at Mays Landing for a class of forty, or four at Pleasantville for a class of one hundred twenty are one extreme, with six showers for twenty-one pupils at River Edge or sixteen showers for sixty pupils at Camden are the other. In Pennsylvania, Manheim Township with twenty-five showers for a class of thirty-five, Upper Darby with twenty-six showers for the largest class of seventy and Altoona West with seventeen showers for a class of fifty-five come the nearest of the thirty-five buildings to the standard set for girls' showers. At the other extreme are Birdsboro with two showers for a class of forty-five, College Hill with two for a class of forty-one, Emlenton with three for a class of sixty-six, and Hegens Township with two for a class of forty.

In the Massachusetts buildings the median class size for girls was fifty and the median number of showers provided was ten. The corresponding figures in the other states were: New York—class forty, showers four; New Jersey—class sixty, showers five; Pennsylvania—class fifty, showers six.

With so great a discrepancy between what is recommended by those responsible for the educational program and what is provided in these new buildings in each of these four states one questions whether the standards are at fault in asking for too much, or the architects and building committees at fault in providing too little. If the former are at fault much money has been wasted in providing too many showers. If the latter are at fault the educational program has been restricted.

Opinions of Physical Education Teachers.—Since each of the several writers we have chosen for our standards seemed to have his own preferred method of arranging the girls' shower, dressing room and locker, an attempt was made to determine which of the different

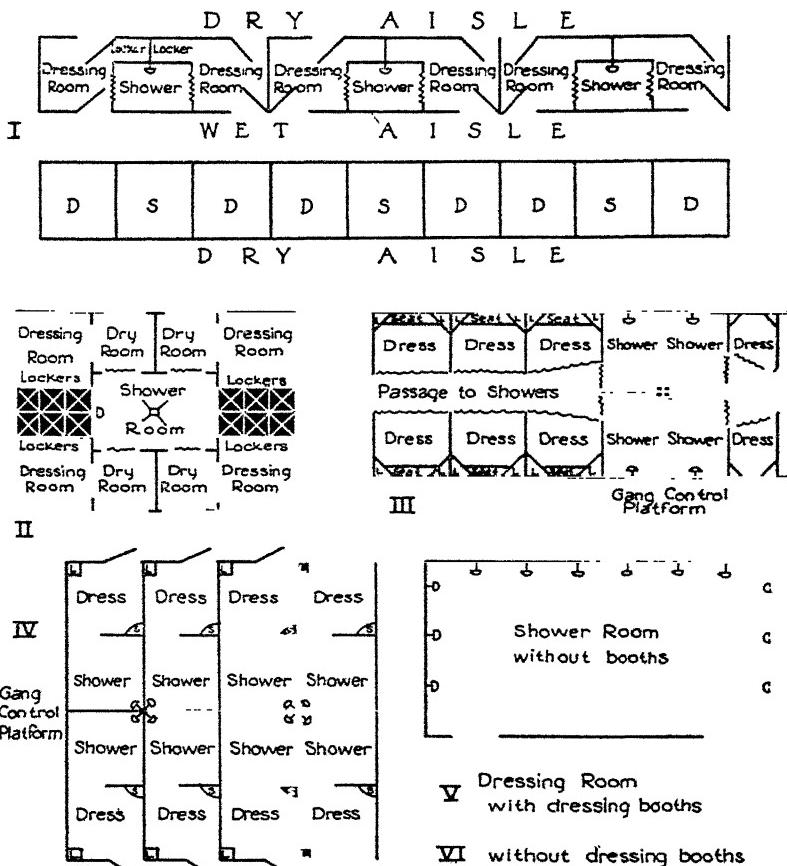
PENNSYLVANIA—GIRLS—*Showers*
Number of Showers

SIZE OF CLASSES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Total
15—19																											1	
20—24																											1	
25—29																											3	
30—34																											2	
35—39																											1	
40—44																											9	
45—49																											2	
50—54																											6	
55—59																											4	
60—64																											0	
65—69																											4	
70—74																											2	
75—79																											0	
80—84																											0	
85—89																											0	
90—94																											2	
Total	3	6	3	3	7	3	1	1	2	0	2	1	1	0	0	1									1	36		

In three buildings two showers were provided for girls although the classes had from forty to fifty pupils. In six buildings there were three showers although in one the largest class had less than 30 pupils and in another the class had over 65.

plans was most acceptable to those directing the physical education program in the field. The diagram shown on this page with the explanation as found on page 40 was prepared and sent to four groups of teachers:

1. Those selected by the state directors of physical education as having an especially effective program.
2. Graduate students in physical education classes of Dr. Frederick Rand Rogers in Boston University School of Education.
3. Graduate students in physical education classes of Dr. Clifford Lee Brownell, Teachers College, Columbia University.
4. Graduate students in physical education classes of Dr. Jay B. Nash, School of Education, New York University.



Shower and Dressing Facilities for Girls.—In our newest and most expensive buildings as well as those of less costly construction there seems to be no common practice regarding the number or arrangement of the showers or dressing rooms. In order that each one of a class of fifty may take a shower after each period of activity in the gymnasium *what is the number of showers* that is desirable —, acceptable —, workable —, objectionable —, impossible —?

On this same five point scale will you rate the six types of showers and booths as illustrated on the accompanying sketch?

Type I. Illustration from New York City Standards.

Two dressing rooms for each shower booth. Lack of teacher control of shower. The usual arrangement is around the walls of the locker room with lockers outside of the booths. Variations are in regard to the lockers; placing the showers and booths in rows; substitution of curtains for doors, or omission of both. Desirable —, acceptable —, workable —, objectionable —, impossible —. Reason for your rating?

Type II. Illustration from Lincoln School, Teachers College, Columbia University.

Four dressing rooms for each shower booth arranged in a square with shower room as center. Variations omit either the dry room, lockers or doors, or all of these. Include, or omit, some or all of the curtains for the eight openings. Desirable —, acceptable —, workable —, objectionable —, impossible —. Reason for your rating?

Type III. Illustration from N.E.A. Commission on Schoolhouse Planning.

Several dressing rooms opening into a common passage leading to the shower. Many variations of this type. One shower instead of two at the end of the passageway, or two with the partition omitted. Sometimes all curtains are removed as well as all partitions for the four showers making a gang shower for eight to twelve girls or even more. The teacher control of the shower is usually found in

this type. As illustrated: desirable ____ , acceptable ____ , workable ____ , objectionable ____ , impossible ____ . Reason for your rating?

Type IV. Standard for Providence, Rhode Island.

A separate dressing room and shower for each girl in the class. No curtains, shoulder high partitions. Teacher control of shower. Desirable ____ , acceptable ____ , workable ____ , objectionable ____ , impossible ____ . Reason for your rating?

Type V.

Gang shower for girls the duplicate of that provided for the boys except that booths, usually as many as the enrollment in a single class, are provided in a separate dressing room. Desirable ____ , acceptable ____ , workable ____ , objectionable ____ , impossible ____ . Reason for your rating?

Type VI.

The shower room and dressing facilities for girls the same as for boys. No stalls or booths in either shower or dressing room. Desirable ____ , acceptable ____ , workable ____ , objectionable ____ , impossible ____ . Reason for your rating?

The reasons given for the ratings were more interesting than the ratings themselves.

Type I. Objections: "lack of teacher control," "no assurance that soap bath has been taken," "too much privacy." Commendations: "girls like privacy and are more apt to take showers if conditions are desirable."

Type II. Objections: "wasteful of time," "not enough showers," "lack of teacher control." Commendations: "economical of space," "preserves modesty."

Type III. Objections: "the passageway was usually too wet," "lack of teacher control," "likely to spread ringworm." Commendations: "compact, lockers handy," "safety of use of water," "best we have seen."

Type IV. Objections: "too expensive," "not necessary," "impossible in large schools," "does not permit socializing benefits of other

plans." Commendations: "it wastes no time," "easy supervision," "most practical."

Type V. Objections: "parents may object," "totally unsuitable for high school age girls," "girls should be provided with facilities that are not public." Commendations: "it was economical," "dry dressing booths," "practical from the point of view of supervision and time element."

Type VI: Was praised by the same group that praised Type V and condemned by those objecting to any form of gang shower for girls. "Probably the best but not ready for it yet," "best if public will stand for it," "means educating the public," were as favorable comments as any one made while "breaks down modesty," "more privacy desirable" were the criticisms.

As far as the desirable number of showers was concerned (in order that each one of a class of fifty might take a shower after each gymnasium period) the majority of the city directors (57 per cent) gave fifty although one in a city noted for the effectiveness of its program (Montclair) wrote nine and another city equally noted (Erie) put twelve. A third of the city directors gave twenty-five as the desirable number and the others were scattered. The graduate students divided almost exactly the same way; 60 per cent were for fifty showers, 34 per cent for twenty-five with the others for smaller numbers. Most of the directors gave twenty-five as an acceptable number although one said fifty and another gave eight. The graduate students agreed with the directors although their range was from forty-five to six. Few of the directors bothered to fill out the "Objectionable" and "Impossible" blanks, contenting themselves with less than whatever number had been placed in the "workable" blank, which spread from forty to four with the median at twelve. The graduate group filled out all the spaces. For "workable" their range was from four to thirty-five, with a median of fifteen; for "objectionable" the range was from four to thirty with the median at twelve. "Impossible" meant twenty showers in two cases, one or two showers in three cases, with ten as the median.

Of the one hundred seven buildings nine of the eighteen in Massachusetts (Arlington, Chicopee, Malden, Quincy, Sharon, Somer-

ville, Springfield, Westfield and Weymouth), equaled or exceed the ratio of twelve showers for a class of fifty that was given as workable by this group of city directors. But two of the thirty-four New York buildings (Kenmore and White Plains) came up to this standard. Two of the twenty in New Jersey (Camden and River Edge) and five of the thirty-five in Pennsylvania (Altoona West, Haverford Township, Manheim Township, Scranton and Upper Darby) were equally well provided with showers.

Table V shows the opinion of these physical education teachers regarding the merits of the different types of shower-locker-dressing room groupings as given in the diagram on page 39. So little difference could be discovered between the reports from the teachers in the field and the graduate students in the three universities, most of whom were employed teachers taking part time work, that all returns were put together and the results expressed in percentages.

Opinions of High School Girls Regarding Showers

Since the teachers of physical education were not in agreement regarding the question of gang showers for girls it was thought advisable to attempt to answer the question indirectly through the girls themselves. Buildings were selected where different arrangements of showers and dressing rooms were installed as well as those where the gang shower was provided for girls. The director was asked to have all the girls in the physical education classes make an unsigned answer to two questions:

1. Should a shower be required after each gymnasium period?
2. What is the reason for your answer?

Replies were received from two thousand five hundred eighteen pupils in six junior high schools in Providence where, in each building, as many showers and as many dressing rooms are installed as there are girls in their largest classes. The girls dress for each gymnasium period and a shower is required afterwards. Ten minutes is allowed for the shower and dressing. Slightly less than ten per cent (244 pupils) said "No," although there was considerable difference between the different buildings. The range of those that objected was from six per cent in one building to nineteen per cent in another.

TABLE V

Rating by physical training teachers of the different types of showers shown on page 39. The figures given are in per cents of the entire number reporting.

	DESIR- ABLE	ACCEPT- ABLE	WORK- ABLE	OBJEC- TIONABLE	IMPOS- SIBLE
Type I. New York. Two dressing rooms for each shower ar- ranged around the walls.	12	36	26	26	0
Type II. Lincoln. Four dressing rooms grouped around a central shower.	2	34	40	22	2
Type III. N.E.A. Three or more dress- ing rooms on either side of passageway leading to shower.	15	34	24	28	0
Type IV. Provi- dence. Separate dressing room and shower for each girl in class. Teacher control of shower.	70	18	6	4	2
Type V. Gang. Dressing booths in separate room.	20	24	20	48	8
Type VI. Gang. No stalls or booths in either shower or dressing room.	10	2	8	44	36

One hundred twelve gave lack of time. In only one building was any other reason given more frequently. Thirty-six of the two thousand five hundred girls were afraid of colds, twenty-one mentioned athlete's foot (fifteen of these in one building), twenty said the program

was not always such as to require it (dancing and marching being mentioned), twelve said baths at home were enough, ten said the water was too cold, six, in three buildings, said it was too much work and four claimed it was a waste of time.

In the Altoona, Pennsylvania, senior high school where the classes for girls enroll fifty to sixty, a total of twenty showerheads is provided. Twelve of these showers are without booths and arranged in a gang, and eight have two dressing rooms for each shower. Ten minutes are allotted for the shower which is a required part of the program. A total of five hundred ninety-six (ninety per cent) said "Yes," giving a wide variety of reasons centering around cleanliness, fresh feeling, freedom from body odors. Slightly under ten per cent, sixty-two in number, objected; twenty-eight for lack of time and twenty for fear of colds. Only seven criticized the lack of privacy and other reasons like personal choice, athlete's foot, become overheated, were each given by one or two girls.

In both Altoona and Providence the shower is required and the time allowed is the same. Altoona has but one shower for each three girls, and twelve of these are without dressing booths, while in Providence there is a separate dressing room with adjacent shower for each girl in the class. Although the facilities are so different practically the same percentage of girls in each school reported favorably on having the shower as a required part of the program (90.6 for Altoona and 90.3 for Providence). The pupils in the two schools were also in close agreement as to the major reason for their objection to the required shower. In Providence forty-six per cent of those who objected gave lack of time and forty-five per cent of the objectors in Altoona gave the same reason. Expressed more concretely: "When I have to dress so fast I tear my stockings and silk stockings cost money. See?"

In a recently built West Orange junior high school the facilities furnished for the girls are the same as for the boys. Classes are large, 70 to 80, and there are only seven showers. The question regarding the shower requirement was answered by 270 girls, 234 agreeing it should be required and 36 (13 per cent) objecting. Nine said it should be personal choice, eight mentioned lack of privacy and the same number were afraid of colds, four said it was

not necessary, three gave lack of time, and only one mentioned athlete's foot.

Replies for seven hundred nineteen girls in East Orange, New Jersey, Senior High School (with four dressing rooms for each shower); from two hundred seventy-five girls in Lynbrook (with two dressing rooms for each shower); and five hundred eight girls in Schenectady, New York, senior high school (with twenty-two showers and an equal number of dressing rooms for classes of forty to fifty), so nearly agreed with those from Providence, Altoona and West Orange that they are not quoted here. It seems safe to conclude that so far as the girls are concerned *number of showers* rather than number and arrangement of dressing rooms is the factor to be considered in planning the shower for girls.

TEAM ROOM OF THE GYMNASIUMS

California Score Card, p. 14.

Where inter-school athletic competition is held, an extra dressing room for visiting teams is desirable. It should have a minimum floor area of 200 square feet, adequate heat, light, ventilation, toilet and shower facilities convenient; provided with lockers or hooks where clothes can be hung. In larger schools additional dressing rooms with showers are necessary for faculty and athletic teams.

N.E.A. Committee, p. 186.

Home Team Room: This is not essential. It will be much more economical to put a few full length lockers 12 inches by 12 inches by 72 inches in the main locker room and to distribute them to give plenty of dressing space on the benches.

Visiting Team Room: It is desirable to have a special dressing room for the visiting team provided with benches and hooks or lockers. This room is located near the entrance and convenient to the shower room. With this arrangement the visiting teams need not enter the general dressing room and all disputes as to property can be avoided.

Williams and Brownell, *Administration of Health and Physical Education*, p. 335.

There is no sound reason why separate locker rooms should be planned for athletic teams if a sufficient number of large lockers capable of holding football or baseball equipment is provided. Visiting team rooms are condemned.

The lack of mention of the team room by several of the authorities on school building standards and its classification as "not essen-

tial" or simply as "desirable" by those who did mention it would indicate its comparative unimportance in the minds of those responsible for the physical education program. Only three of the Massachusetts buildings allotted space for a team room: Rockland set aside a room 10 by 16 for the visiting team, Springfield enclosed a space in the boys' locker room, 10 by 16, for the team, and Weymouth provided a home team room 14 by 37 and one for visiting teams 14 by 28, each with a shower room with five shower heads.

Nine of the New York buildings have team rooms. Addison, with two rooms each 6 by 11, and Ticonderoga with two, each 12 by 16, were the only ones that made provision for the girls' team. Canandaigua with a room 12 by 20, Canastota one 14 by 24, Liverpool one 8 by 28, and Plattsburg one 12 by 24, labeled them as for visiting teams, while in Nyack a room 16 by 32, and one in White Plains 11 by 46, were called home team rooms. On the Waterloo plan a room 11 by 22 with one shower and one toilet, located adjacent to the boys' locker room but with an entrance from the corridor was labeled locker room.

In New Jersey, the Hamilton Township building has a room 22 by 32 for the team and one 22 by 28 for the rest of the boys in the school. It was the only New Jersey building to have special quarters for the team.

In Pennsylvania, eleven buildings provided team rooms, almost as many as in the other three states combined. In Allentown the area 20 by 24 for visitors and 14 by 38 for the team was the same as for all the boys in the school. In Erie also, the team room for boys was slightly larger than the boys' locker room for the whole school. The same thing was true regarding the division of space between the girls' team and the girls who were not on the team. Haverford Township provided two rooms for visiting teams. Each of the Lancaster high schools had visiting team rooms for both boys and girls which was also the case in North Braddock and Stroudsburg. Emlenton, Lockhaven, Scranton, and Upper Darby, each had one team room.

It was thought that there might be more of a tendency to provide team rooms in those buildings where large provision was made for spectators at the games than in those where the bleacher space was restricted but this was found not to be the case. Of the twenty-two

buildings with team rooms, six did not have permanent bleachers, and five of the eight buildings where the bleachers space equaled or exceeded the playing floor did not have team rooms. The median building of those having both team rooms and permanent bleachers had half as much space for spectators as for the gymnasium floor itself.

SANITARY FEATURES OF THE GYMNASIUMS

California Score Card, p. 15.

An adequate number should be provided. Toilets should be convenient to dressing rooms. Natural ventilation, cross circulation by windows. Wash basins.

Nash, *Administration*, p. 248.

For boys a minimum size lavatory and toilet room should be eight by ten feet and for girls ten by fifteen feet.

N.E.A. Committee, p. 156.

Space is economized by having the toilets at the side of the drying room.

Strayer and Engelhardt, *Standards*, p. 36.

Gymnasium dressing rooms, shower rooms should be provided with toilet conveniences.

In all too many of these one hundred seven buildings no provision at all was made for toilets in either the locker rooms or shower rooms. In a few cases a general toilet room for the building was located adjacent to the locker room of the gymnasium, but in others the only access to a toilet room was up a flight of stairs and a considerable distance along a corridor. Seven of the eighteen Massachusetts buildings had the same standards for the gymnasium toilet rooms (per cent of outside light and number of fixtures) as for those in the building itself. In four of these the entrance to the toilet room was from the shower as well as the locker room. Fifteen of the thirty-four New York buildings had adequate sanitary facilities. This was true in six of the twenty New Jersey buildings and ten of the thirty-five in Pennsylvania.

TOWEL AND SUIT FACILITIES OF THE GYMNASIUMS

California Score Card, p. 14.

Minimum floor area 60 square feet; size to increase with enrollment; used to store supplies which are in constant use; adequate light, heat, ventilation and sanitation; equipped with shelves; delivery counter; con-

venient to offices and dressing rooms; storage space for clean and soiled towels. In larger schools a separate room for towels and swimming suits is desirable.

Nash, *Administration*, p. 266.

One of the most essential and yet the most neglected elements in public school administration is the furnishing of towels in wash rooms and for showers.

N.E.A. Committee, p. 157.

The school should provide a clean towel for every boy coming to the gymnasium. These towels can be laundered at small expense if an electric washer is installed.

Williams and Brownell, *Administration of Health and Physical Education*,

p. 357.

Ideally, such equipment (costumes, towels) should be provided at public expense in secondary schools. Development of physical education programs has presented the difficult problem of insuring clean uniforms, towels and swimming suits. Where the gymnasium, athletic field, or swimming pool are in almost constant use by students or for community purposes the trend appears to be in the direction of maintaining school laundries.

These one hundred seven buildings illustrate the assertion by Nash that the furnishing of towels is neglected in public school administration. A few use the basket locker system and provide a space for these baskets apart from the pupils' lockers but the plans for less than one fourth of the schools indicate in any way that it is the responsibility of the school to furnish towels.

DRYING ROOM

California Score Card, p. 14.

Drying Room (Suits): Necessary in larger schools and especially where no other provisions have been made. Minimum floor area, 120 square feet, to increase with enrollment. Adequate ventilation and sanitation; equipped with heat and facilities for hanging suits.

Nash, *Administration*, p. 247.

Another important service unit is the drying room for athletic clothing, one hundred to one hundred seventy-five square feet. This should be equipped with hooks and hangers and provided with extra ventilation and heat.

Williams and Brownell, *Administration of Health and Physical Education*,

p. 355.

Of course some method must be used to dry uniforms over night.

In but one Massachusetts building, two in New York, two in New Jersey and two in Pennsylvania, was it indicated on the plans that special facilities were planned for drying athletic clothing.

SUMMARY

In but few respects do the provisions for the physical education program in these one hundred seven buildings conform to the standards set up by experts in planning school buildings and those interested in having an adequate physical education program.

PHYSICAL DIRECTOR'S OFFICE

In seventeen buildings the offices were located so that the director could oversee both the locker room and the gymnasium floor. In twenty-four the office was adjacent to the gymnasium and in twenty-two near the locker room. In twenty it was placed with little relation either to the gymnasium or lockers. The median width for the office in three of the four states was ten feet, the median length in Massachusetts and Pennsylvania was twelve feet, New York fourteen and New Jersey sixteen feet. The range in width was from six feet to twenty-four feet and the length varied from eight feet to twenty-four.

EXAMINATION ROOM

This was found in but two buildings, one in Massachusetts and one in Pennsylvania.

GYMNASIUM

Number.—The two buildings in Massachusetts that have two separate gymnasiums both enrolled less than one thousand pupils and five schools that enrolled over one thousand pupils each had but one gymnasium. In New York, one building with less than five hundred pupils had two gymnasiums, one with over one thousand pupils had two gymnasiums, two with over one thousand pupils had two, and two with over one thousand had but one. In Pennsylvania four of the larger high schools had two gymnasiums, and seven buildings enrolling over one thousand pupils had but one. Each of these

seven, however, could be divided into two parts by partitions of one kind or another.

Location.—In more than a third of these new buildings the gymnasium was located under the auditorium and a tenth have the gymnasium-stage arrangement. Although neither position is recommended by any school authority the practice is continued on the ground that it lowers the cost of the building. There is no evidence in this study to support this contention. The buildings that have the gymnasium in a separate wing with cross ventilation and direct sunlight show no greater cost, either on a cubic foot or pupil enrolled basis, than do the buildings where the gymnasium is under the auditorium. Without exception every principal having the gymnasium as a stage for the auditorium criticized the arrangement. All agreed that either the gymnasium or the auditorium could not be used when a school activity was in progress in the other.

Size.—With but ten exceptions and all ten because they were less than forty feet in width, the gymnasium equaled the minimum dimensions of forty by sixty feet.

Height.—In all but six of these buildings the ceiling of the gymnasium was eighteen or more feet high. In the six exceptions all were located under the auditorium.

Light.—Few of the gymnasiums could be said to be flooded with light. Only in New Jersey did the number of buildings that had twenty per cent or more of window area exceed the number that had less than ten per cent. In Pennsylvania the number of buildings with less than ten per cent window area was twice as large as the number that reached the minimum of twenty per cent.

Walls.—In ninety per cent of these buildings the gymnasium walls were of brick.

Floor.—With one exception, the gymnasium floors were either wooden blocks on end, or maple, the latter being used in over ninety per cent of these buildings.

BLEACHERS

Forty per cent of the Massachusetts buildings made no provision for permanent bleachers. This was also the case in thirty per cent of the New York buildings, ten per cent of those in New Jersey

and fourteen per cent of those in Pennsylvania. Where bleachers were provided a somewhat similar difference is noted between the four states. The area of the space given over to bleachers in the Massachusetts buildings, compared to the area provided for the playing floor, ranged from six per cent to fifty-five per cent. In New York and New Jersey the range was from fifteen to one hundred per cent. The medians for the four states were: Massachusetts, twenty-five per cent; New York, forty per cent; New Jersey, thirty per cent; Pennsylvania, forty per cent.

CORRECTIVE ROOMS

In only three buildings was special provision made for corrective work.

DRESSING ROOMS

These were located adjoining the gymnasium in fifty-seven of the buildings, under the gymnasium in twenty-eight, under the bleachers in nine, and almost without relation to the gymnasium in thirteen. A wide variation is shown both in the area allotted for each pupil as well as the relation between the window area and floor area. In most of the buildings the floor was of concrete and the walls of brick.

SHOWERS

There was almost no relation between the number of showers provided for either boys or girls and the size of the physical education classes. In nineteen of these buildings the class size for girls was reported as sixty to sixty-nine pupils. In these nineteen buildings the number of showers was three, four, five, six, seven, nine, ten, twelve, sixteen, or twenty-four. Three of these buildings with classes of sixty to sixty-nine had but four showers and three of them had six.

The overhead shower was used in practically all of the shower rooms for boys and most of the shower rooms for girls. No director was found who did not object to the overhead shower for the girls and most of them preferred the shoulder height for the boys as well. The only justification that anyone gave for the overhead

arrangement was that if the shower was placed high enough it would be more fool proof and so keep down the repair bills.

The relation between dressing rooms and shower heads ranged from no dressing rooms at all, the arrangement for girls being a duplicate of that planned for the boys, to four dressing rooms grouped around each shower. While the directors preferred a single dressing room for each shower, and as many of each as there were girls in a class, the girls themselves showed no such preference. The number who objected to having the shower as part of the requirements of the physical education period was largest where the number of showers was small and least where the number of showers was most adequate. No significant differences could be seen in returns from schools that have gang showers without dressing booths and schools that have a separate shower and booth for each girl in a class.

TEAM ROOM

Although a separate room for the school team is considered unimportant by those who have set up standards for school buildings twenty-two of these buildings made special provision for the team and in three buildings the team received more locker and shower space than was allotted to all the rest of the school.

SANITARY FACILITIES

In about one third of the buildings the same standard was observed for number and location of toilet fixtures in the locker and shower rooms as for the building itself.

TOWEL AND SUIT FACILITIES

Few of these plans showed special provision for towels and but seven showed a drying room for athletic clothing.

Chapter III

A SCORE CARD FOR MEASURING THE PHYSICAL EDUCATION FACILITIES

CONSTRUCTION

IN planning a school building a most serious problem is that of determining what may best be eliminated from the many conflicting claims for space in the new building with the least injury to an efficient educational program.

It is convenient for each instructor to have his own home room; for each science (physics, chemistry, biology, general science) to have a separate laboratory, work room and special recitation room; and for each industrial activity (woodwork, electricity, machine, sheet metal, printing) to have a special shop. The superintendent may desire an auditorium large enough to house those who wish to attend the annual graduation day exercises while the principal insists upon a smaller hall for groups of three or four class sections. Always there must be some eliminations, some reductions of space requirements and some provision for duplicate use of rooms before the size of the building can be brought within the amount that the community is willing to pay for its construction.

Since only one of these 107 buildings, the most expensive one of the group, came near to meeting what seem to be the required facilities for the physical education program an attempt has been made to secure an expression of opinion from representative leaders in the field regarding the comparative value of the different type of facilities. In order that it might be as valid as possible this opinion was sought from those who are in large measure responsible for the present day program. The state directors of physical education, city directors whose work was indicated by the state director as outstanding, and college professors of physical education whose large classes

of part time and full time students are evidence of their strong influence in determining the program of today as well as the proposed program for tomorrow, were asked to evaluate the different items.

From the literature on standards for the physical education department as given in the preceding chapter a brief description was made of what was considered to be the most desirable location, size, lighting and equipment for (1) departmental offices, (2) gymnasium, (3) bleachers, (4) corrective room, (5) apparatus and seat storage, (6) service rooms (lockers, showers, sanitary) and (7) team rooms.

Under each of these descriptions were several others arranged in what seemed to be a descending order of value, so far as one could judge from the literature on standards. In most cases the levels given were brief descriptions of what was found in one or more of the buildings studied. This tentative score card was then sent to twenty state directors, an equal number of city directors and thirty professors of physical education. Each was asked to determine the value he would give to each of the seven divisions on the basis of 1,000 points as the value of the entire group of facilities.

The majority of those who replied wrote letters with constructive criticisms of the descriptions, or the arrangement of items, or of both descriptions and arrangement. The difference of opinion regarding the importance of these seven divisions is shown in Table VI on page 84. For the gymnasium the highest value given by anyone was two and three fourths times as much as the lowest value given. (Low 200, High 550.) For the service rooms the highest value given was two and a half times the lowest value given by anyone to this division. (Low 200, High 550.) The highest value for departmental offices was four times the lowest value given. (Low 50, High 200.) For the apparatus rooms the ratio was five to one (Low 25, High 125), for bleachers six to one (Low 25, High 150), and for the corrective room eight to one (Low 25, High 200). The greatest difference of all was seen in the rating given to the team room. Five (a state director, two city directors and two professors of physical education) gave it no value at all and four (a state director, a city director, and two professors) valued it at one tenth of the entire thousand points. Since the sum of the medians totaled but 975 points, the difference between that and 1,000 points (25 points) was added

TABLE VI
Evaluation of Facilities for Physical Education Score Card

	<i>Gym</i>	<i>Bleachers</i>	<i>Oc.ices</i>	<i>Correct</i>	<i>Service</i>	<i>Apparatus</i>	<i>Team</i>
<i>State Directors</i>							
Schrader—Mass.	300	100	150	125	200	75	50
Jones—New York	550	50	100	100	200		
Uhl—New Jersey	500	50	75	25	300	25	25
Hendricks—Delaware	300	100	100	50	300	100	50
Sandlin—Texas	250	100	150	50	300	50	100
<i>City Directors</i>							
Wilson—Hartford	375	50	100	75	325	100	25
Armstrong—Montclair	400	25	50	100	275	125	25
LaSalle—East Orange	300	50	125	100	300	75	50
Geisel—Harrisburg	300	100	150	100	250	100	0
Wolfe—Altoona	400	100	100	150	150	75	25
Herkimer—Niagara Falls	300	100	150	125	250	50	25
Keller—Toledo	250	150	125	50	200	125	100
Rowe—Cleveland	350	50	175	25	300	75	25
Rath—Indianapolis	400	25	150	125	250	50	0
Anderson—Kansas City	300	50	100	100	300	100	50
Colestock—Pasadena	225	75	150	200	200	100	50
<i>Physical Education Professors</i>							
Giauque—Boston	350	25	100	200	225	75	25
Williams—Columbia	300	100	200	100	250	50	0
Brownell—Columbia	350	75	125	100	225	75	50
Maroney—Columbia	300	75	100	150	300	75	50
Nash—New York	375	25	100	50	375	25	50
Braucher—Nat. Recreation	500	60	80	60	200	60	40
Savage—Oberlin	350	50	100	100	300	100	0
Clark—Syracuse	450	50	100	100	200	50	50
Mitchell—Michigan	350	100	100	100	200	50	100
Sharman—Michigan	300	50	100	75	360	75	40
Patty—Indiana	250	100	150	100	300	100	100
Steinhaus—Chicago Y.	300	100	150	150	200	50	50
McCloy—Iowa	330	35	135	70	300	65	65
Brewer—Missouri	300	50	150	150	200	75	75
Scott—Rice Institute	300	50	150	75	300	50	75
Neilson—Stanford	250	100	175	75	225	100	75
Cozens—California	200	75	175	100	275	125	50
Bovard—Oregon	300	50	150	100	300	50	50
							25
First Quartile	300	50	100	75	200	50	50
<i>Medians</i>	325	50	125	100	275	75	
Third Quartile	375	100	150	125	300	100	50
<i>Range</i>	200—550	25—150	50—200	25—200	150—375	25—125	0—100

to the amount assigned to the gymnasium chiefly because the median was no higher than the first quartile.

The original tentative score card was then sent a second time to the same list of state directors, city directors, and college professors of physical education with the medians and quartiles for the seven major divisions entered upon the evaluation sheet. The request this second time was that a definite number of points (the median of the previous evaluation) be distributed among the several subdivision items. For example, the 125 points assigned to departmental offices was to be divided between the examination room and directors' offices so as to show the comparative importance of each. The 325 points assigned to the gymnasium were to be divided among the six items, (1) number in relation to building enrollment, (2) location, (3) size, (4) window placement and area in relation to floor area, (5) nature of wall surface, and (6) type of floor, so as to indicate how the scorer would weigh each of the six items for importance. In like manner 275 points were to be apportioned between the four items, (1) dressing rooms for boys and girls, (2) shower rooms for each, (3) sanitary facilities and (4) provision for towels and the drying of athletic clothing.

Some replied to this second request who had not replied to the first in time to have their evaluation included in the tabulation, while some who evaluated the seven major divisions did not send in their weighting of the sub-divisions. The tabulation of the returns appears in Table VII on page 58. It will be seen that the range was large, as in the evaluation of the major divisions, but the differences between the first and third quartiles are comparatively small.

Because of the wide range of values given to some of those subdivisions the names and position held of each one of the scorers was added to Table VII and a mimeograph copy sent to each with the request that he compare his own rating with that of the others either to confirm his previous rating or to make such changes as he felt were desirable. Some changes were made in evaluations and these were used in determining revised medians.

With each return of the score card some of the accompanying letters criticized either the order of arrangement of the items, or the

TABLE VII
Evaluation of Facilities for Physical Education Score Card

	GYMNASIUM						OFFICES SERVICE FACILITIES							
	No.	Loc.	Size	Light	Wall	Fl'r	Dr.	Ex.	Dr.	Sh. B	Sh. G	San	Tow	Dry
<i>State Directors</i>														
Edwards—Maine	50	60	90	40	40	45	50	75	50	50	50	50	50	25
Schrader—Mass.	90	45	75	40	25	50	80	45	85	50	50	45	30	15
Jones—N. Y.	100	50	40	60	30	45	50	75	45	55	55	40	45	35
Uhler—N. J.	100	50	75	50	25	25	50	75	75	75	75	25	10	15
Rogers—Wash. D. C.	25	50	75	75	25	75	25	100	50	25	25	75	50	50
Hendricks—Del.	75	50	50	50	45	55	75	50	50	50	50	45	40	40
Sandlin—Texas	100	75	75	50	25	25	50	75	50	50	50	25	50	25
<i>City Directors</i>														
LaSalle—East Orange	60	60	60	60	40	45	—	—	50	50	50	50	50	25
Geisel—Harrisburg	75	50	50	50	40	60	75	50	50	75	75	40	20	15
Wolfe—Altoona	125	50	50	25	25	50	100	25	100	50	50	25	25	25
Herkimer—Niagara F.	85	35	80	55	25	45	—	—	75	50	50	50	25	25
Keller—Toledo	70	55	70	50	35	45	45	80	65	60	60	50	30	10
Rath—Indianapolis	75	60	60	60	30	40	50	75	70	37	37	60	40	40
Anderson—Kansas C.	100	100	50	25	25	25	75	50	90	70	55	25	20	15
<i>Professors Phy. Ed.</i>														
Rogers—Boston	40	40	125	40	40	40	70	55	80	40	50	40	40	25
Giaque—Boston	80	70	40	60	25	50	50	75	60	60	60	50	30	15
Williams—Columbia	85	40	60	50	40	50	75	50	50	50	50	50	40	35
Brownell—Columbia	85	40	60	50	40	50	75	50	50	50	50	50	40	35
Maroney—Columbia	80	45	60	50	40	50	75	50	50	50	50	50	40	35
Clark—Syracuse	50	25	100	75	25	50	75	50	50	50	50	75	25	25
Sharman—Michigan	120	70	45	40	20	30	60	65	60	50	50	45	40	30
Steinhaus—Chicago Y.	75	50	50	50	50	50	60	65	50	50	50	60	40	25
McCloy—Iowa	80	60	80	40	25	40	70	55	60	60	60	35	35	25
Brewer—Missouri	100	25	75	50	25	50	50	75	75	60	60	40	30	10
Lee—Nebraska	125	60	30	50	20	40	70	55	55	55	55	55	35	20
Scott—Rice Inst.	60	55	70	45	40	55	65	60	50	45	45	45	50	40
Neilson—Sanford	100	50	75	25	25	50	75	50	100	50	50	25	25	25
Cozens—California	45	60	80	60	40	40	65	60	50	50	50	50	50	25
LaPorte—So. Calif.	75	50	75	50	25	50	75	50	50	50	50	50	50	25
Bovard—Oregon	90	75	75	50	10	25	80	45	50	50	50	50	50	25
<i>First Quartile</i>														
<i>Medians</i>	75	45	50	40	25	40	50	50	50	50	50	40	30	20
<i>Third Quartile</i>	100	60	75	50	40	50	75	75	75	55	50	50	50	30
<i>Range</i>	25-	25-	30-	25-	10-	25-	25-	25-	45-	25-	25-	25-	10-	10-
	125	100	125	75	45	75	100	100	100	75	75	75	50	50

descriptions of the levels as being ambiguous or as over emphasizing certain items. For example the several levels describing the director's office appeared as follows on the first score card that was sent out:

1. Departmental Offices.
 - a. First level.

A small well lighted room 10 feet by 12 feet, conveniently located for supervision of athletic field, gymnasium and locker room. Equipped with private shower, toilet facilities and closet.
 - b. Second level.

Same as (a) but so located as to permit view of but one activity.
 - c. Third level.

Location inconvenient for the supervision of any activity but size and equipment as in (a).
 - d. Fourth level.

Markedly larger or smaller than 10 feet by 12 feet, without service equipment; inconvenient location.
 - e. Fifth level.

Any place to put a desk without regard to the inconvenience or work of the physical director.

Some, in criticizing the descriptions, said that "location" (which marks the difference between level a, level b, and level c) is not important as compared to service facilities. Others wrote that the service facilities provided for the students should be used by the director and it was an unnecessary expense to include them in the director's office. Others wrote that the director's office should be large enough to serve as an examination room especially for the smaller buildings where the director was the only instructor and still others claimed that ratio of window area to floor area was needed to be emphasized as a well lighted office was essential.

It was considered as being outside the province of this study to attempt to secure an evaluation of the comparative merits of location, window area, service facilities, size, etc., so they were arbitrarily taken as of equal value and the descriptions rewritten as follows:

1. Physical Director's Offices.
 - (a) Boys' Activities.
 - i. First level.

A small, well lighted room about 10 feet by 12 feet, conveniently located for supervision of athletic field, gymnasium, and

- locker room. Equipped with private shower, toilet and closet.
- 2. Second level.
Inferior to (a) in *one* respect. Either permits view of but one activity, or lacks service equipment, or is markedly larger or smaller than 10 feet by 12 feet, or lacks adequate outside window area.
 - 3. Third level.
Inferior to (a) in *two* essential respects; location, or size, or service features, or light.
 - 4. Fourth level.
Inferior to (a) in *three* essential respects.
 - 5. Fifth level.
Any place to put a desk without regard to the convenience or work of the physical director.

The descriptions of the dressing rooms on the first draft sent out were also criticized as overemphasizing location so they were rewritten placing location, area per pupil in largest class, per cent of window area, and material used for walls and floor as of equal value in determining the level at which the dressing room should be scored.

The order of arrangement and grouping of the major divisions was then changed making three heads: I. Departmental Offices. This included the directors' offices and the examination rooms. II. Gymnasium Facilities. Under this head were grouped (1) Gymnasium Rooms, (2) Bleacher Space, (3) Corrective Room, (4) Apparatus and Storage Room. III. Service Facilities. This included (1) Dressing Rooms for boys and girls, (2) Shower Rooms, (3) Team Room, (4) Towel and Suit Facilities and (5) Drying Room for Athletic Clothing.

Unfortunately the directions for evaluating the different levels were not sufficiently clear. Each of the previous requests had been to have the allotted number of points distributed among two or more items. For this final evaluation of levels it was stated "the one considered to be the best may be given a value equal, or less, than that given to the subdivision of which it is a part, but it cannot be greater. Two or more levels may be given the same rating if they are considered to be of equal value." In ten of the twenty-seven returns the number of points assigned to any facility (i.e. the 30

SCORE CARD FOR PHYSICAL EDUCATION FACILITIES

		1	2	3
I. Departmental Offices				110
1. Physical Director		30	60	
(1) Boys' Activities Level a <u>30</u> Level b <u>25</u> Level c <u>20</u> Level d <u>10</u> Level e <u>5</u>				
(2) Girls' Activities Level a <u>30</u> Level b <u>25</u> Level c <u>20</u> Level d <u>10</u> Level e <u>5</u>		30	50	
2. Examination Room		25	50	
(1) Boys' Activities Level a <u>25</u> Level b <u>20</u> Level c <u>15</u> Level d <u>5</u> Level e <u>5</u>				
(2) Girls' Activities Level a <u>25</u> Level b <u>20</u> Level c <u>15</u> Level d <u>5</u> Level e <u>5</u>		25	50	
II. Gymnasium Facilities				565
1. Gymnasium Rooms			350	
(1) Number Level a <u>85</u> Level b <u>70</u> Level c <u>60</u> Level d <u>40</u> Level e <u>25</u>		85		
(2) Location Level a <u>60</u> Level b <u>50</u> Level c <u>30</u> Level d <u>20</u> Level e <u>10</u>		60		
(3) Size and Height Level a <u>75</u> Level b <u>65</u> Level c <u>50</u> Level d <u>30</u> Level e <u>15</u> Minus for width <u>2</u> Minus for length <u>2</u> Minus for height <u>2</u>		75		
(4) Light Level a <u>50</u> Level b <u>40</u> Level c <u>30</u> Level d <u>20</u> Level e <u>10</u>		50		
(5) Walls Level a <u>25</u> Level b <u>20</u> Level c <u>15</u> Level d <u>10</u> Level e <u>5</u>		25		
(6) Floors Level a <u>55</u> Level b <u>45</u> Level c <u>40</u> Level d <u>30</u> Level e <u>15</u>		55		
2. Bleacher Space Level a <u>40</u> Level b <u>30</u> Level c <u>20</u> Level d <u>20</u> Level e <u>10</u>			40	
3. Corrective Room				125
Level a <u>125</u> Level b <u>100</u> Level c <u>60</u> Level d <u>40</u> Level e <u>20</u>				
4. Apparatus and Storage Level a <u>50</u> Level b <u>40</u> Level c <u>20</u> Level d <u>15</u> Level e <u>5</u>			50	
III. Service Facilities				325
1. Dressing Room			100	
(1) Boys' Activities Level a <u>50</u> Level b <u>40</u> Level c <u>30</u> Level d <u>15</u> Level e <u>5</u>		50		
(2) Girls' Activities Level a <u>50</u> Level b <u>40</u> Level c <u>30</u> Level d <u>15</u> Level e <u>5</u>		50		
2. Shower Room			100	
(1) Boys' Activities Level a <u>50</u> Level b <u>40</u> Level c <u>25</u> Level d <u>15</u> Level e <u>5</u>		50		
(2) Girls' Activities Level a <u>50</u> Level b <u>40</u> Level c <u>40</u> Level d <u>20</u> Level e <u>10</u>		50		
3. Tea Room			25	
(1) Boys' Activities Level a <u>20</u> Level b <u>15</u> Level c <u>10</u>		20		
(2) Girls' Activities Level a <u>5</u> Level b <u>3</u> Level c <u>0</u>		5		
4. Sanitary Features			50	
Level a <u>50</u> Level b <u>40</u> Level c <u>30</u> Level d <u>10</u> Level e <u>5</u>				
5. Towel and Suit Facilities			30	
Level a <u>30</u> Level b <u>20</u> Level c <u>10</u>				
6. Drying Room for Athletic Clothing			20	
Level a <u>20</u> Level b <u>10</u> Level c <u>5</u>				
	Total		1000	1000

Building..... Scorer..... Date.....

points allotted to the office of the director for boys' activities) were distributed among the five levels rather than used as a measure against which each of the levels was scaled. These ten were not returned to the scorers for revision for two reasons. First the score card had already been sent out four times and several of those who sent in returns the fourth time intimated that they had given the score card as much time as they felt justified in spending upon it. The second reason was that for all but a few of the levels half or more of those who sent in returns were in agreement as to the value. The completed score card with its description of the different levels and their values follows:

SCORE CARD FOR PHYSICAL EDUCATION FACILITIES

in the Junior and Senior High School

<i>Departmental Offices</i>	<i>Levels</i>	<i>1</i>	<i>2</i>	<i>3</i>	
i. Physical Director's Offices					110
(a) Boys' Activities					60
1. First level—A small well lighted room about 10 feet by 12 feet, conveniently located for supervision of athletic field, gymnasium, and locker room. Equipped with private shower, toilet and closet.					30
2. Second level—Inferior to (a) in <i>one</i> respect. Either permits view of but one activity, or lacks service equipment, or is markedly larger or smaller than 10 feet by 12 feet, or lacks adequate outside window area.					25
3. Third level—Inferior to (a) in <i>two</i> essential respects: location, or size, or service features, or light.					20
4. Fourth level—Inferior to (a) in <i>three</i> essential respects.					10
5. Fifth level—Any place to put a desk without regard to the convenience or work of the physical director.					5
(b) Girls' Activities					30
1. First level—A small well lighted room about 10 feet by 12 feet, conveniently located for supervision of athletic field, gymnasium, and locker room. Equipped with private shower, toilet and closet.					30
2. Second level—Inferior to (a) in <i>one</i> respect. Either permits view of but one activity, or lacks service equipment, or is markedly larger or smaller than 10 feet by 12 feet, or lacks adequate outside window area.					25
3. Third level—Inferior to (a) in <i>two</i> essential respects: location, or size, or service features, or light.					20

A SCORE CARD FOR MEASURING THE FACILITIES

63

	Levels	1	2	3
4. Fourth level—Inferior to (a) in <i>three</i> essential respects.		10		
5. Fifth level—Any place to put a desk without regard to the convenience or work of the physical director.		5		
2. Examination Room			50	
(a) Boys' Activities				25
1. First level—Size about 12 feet by 20 feet, in direct connection with the physical director's office and locker room, 20 per cent light.		25		
2. Second level—Inferior to (a) in <i>one</i> essential respect. Either as to location, or size, or light.		20		
3. Third level—Inferior to (a) in <i>two</i> essential respects.		15		
4. Fourth level—An enlarged, poorly lighted closet space located without regards to the needs of the physical education department, or convenience of the director.		5		
(b) Girls' Activities.			25	
1. First level—Size about 12 feet by 20 feet, in direct connection with the physical director's office and locker room. Outside window area equal to 20% of floor area.		25		
2. Second level—Inferior to (a) in <i>one</i> essential respect. Either as to location, or size, or light.		20		
3. Third level—Inferior to (a) in <i>two</i> essential respects.		15		
4. Fourth level—An enlarged, poorly lighted closet space located without regard to the needs of the physical education department, or convenience of the director.		5		
5. Fifth level—Any space large enough for a cot. No dressing room or service facilities.				5

Gymnasium Facilities

1. Gymnasium Rooms		350	565
(a) Number			
1. First level—Two gymnasiums for a total enrollment of not more than 700.		85	
2. Second level—One gymnasium for each 500 pupils enrolled.		70	
3. Third level—One gymnasium for each 700 pupils enrolled.		60	
4. Fourth level—One gymnasium in schools enrolling less than a thousand pupils.		40	
5. Fifth level—One gymnasium in schools enrolling a thousand or more pupils.		25	
(b) Location of Gymnasium			60
1. First level—Ground floor at, or above, grade elevation; separate unit or wing; south exposure. At a point which permits of close correlation of work on athletic field with the use of the gymnasium.			60
2. Second level—Integral part of main building with one long side of gymnasium against some other part of the building, otherwise as in (a).			50
3. Third level—So located that light is inadequate; either less than 20 per cent, or from skylights, or from ends rather than long axis.			30

SCORE CARD FOR PHYSICAL EDUCATION FACILITIES
in the Junior and Senior High School

	Levels	1	2	3
4. Fourth level—Stage of the auditorium, or auditorium gymnasium, or under auditorium. In any case so located as to have at least 10 per cent of window area compared to floor area.	20			
5. Fifth level—Hole in the ground under the auditorium or class rooms; less than 10 per cent light.	10			
(c) Size and Height of Gymnasium.		75		
1. First level—Sixty by ninety feet with height of 20 to 24 feet under all beams and trestles.	75			
2. Second level—50 by 80 feet with height of 20 to 22 feet under all beams and trestles.	65			
3. Third level—45 feet by 70 to 18 to 20 feet.	50			
4. Fourth level—40 feet by 60 feet by 18 feet.	30			
5. Fifth level—Narrower, shorter or lower than 40 by 60 by 18. The score for size and height should be reduced 2 points for each foot in width less than 40; 2 points for each foot in length less than 60, and 2 points for each foot in height less than 18.				
(d) Light for Gymnasium.		50		
1. First level—Two long sides of the gymnasium exposed to light and air. Window area over 25 per cent of floor area. No skylights.	50			
2. Second level—20 per cent or more of window area, but from one long axis only.	40			
3. Third level—20 per cent window area, but from side and ends or overhead skylights.	30			
4. Fourth level—Under 20 per cent window area but over 10 per cent.	20			
5. Fifth level—Less than 10 per cent window area.	10			
(e) Walls.		25		
1. First level—"Anything you can walk on makes a good wall surface." Glazed brick or oak wainscot, with soft brick or sound absorbing plaster for the upper part of the wall.	25			
2. Second level—Glazed brick, or tile or smooth face brick walls.	20			
3. Third level—Common brick wall throughout without wainscot.	15			
4. Fourth level—Cement plaster wainscot with sand-finished plaster above.	10			
5. Fifth level—Unsurfaced concrete or concrete block. Sliding doors.	5			
(f) Floors.		55		
1. First level—Narrow width tongue and groove hard maple over diagonally laid hard pine on sleepers with noise reducing material between the floors. Provision made on all walls and door openings for wide expansion joint to prevent buckling.	55			
2. Second level—Wood blocks on end for upper floor, otherwise as in (a).	45			

A SCORE CARD FOR MEASURING THE FACILITIES 65

	<i>Levels</i>	1	2	3
3. Third level—Either maple strip or wood block with under floor, but without angle iron covered expansion joint at wall.	40			
4. Fourth level—Wood blocks on end laid directly upon concrete without under floor on sleepers.	30			
5. Fifth level—Mastic, or linoleum, laid directly upon the concrete.	15			
2. Bleacher Space.				40
a. First level—Seating arrangements for half or less of student body on lifting tiers of seats placed on the two long sides of the gymnasium.	40			
b. Second level—Same as in (a) but removable bleachers to be placed on the floor when needed.	30			
c. Third level—Permanent non-lifting bleachers starting at floor level for half the student body.	20			
d. Fourth level—Galleries for spectators with front wall eight or more feet above floor level.	20			
e. Fifth level—Gallery or permanent bleacher area equal to or greater than playing area.	10			
3. Corrective Room.				125
a. First level—Approximately 25 feet by 50 feet; adequately lighted (at least 20 per cent) and located in direct connection with the examination room.	125			
b. Second level—Approximately 20 to 30 feet with adequate heat, light and ventilation; located as part of the physical education unit.	100			
c. Third level—Regular class room used jointly for health education and correction. Extra storage space for equipment.	60			
d. Fourth level—End of main gymnasium fitted with stall bars, benches, plinths, mats, etc.	40			
e. Fifth level—Any odd shaped, poorly lighted space, large enough for some corrective activities.	20			
4. Apparatus and Storage Room.				50
a. First level—Adjoining each gymnasium on same floor level with double door opening for piano, mats, apparatus. Approximately 200 square feet; outside windows. Separate provision for storing portable bleachers.	50			
b. Second level—As in (a) except bleachers are stored with apparatus.	40			
c. Third level—Storage room located on different level from that of gymnasium floor, or separate from it by passageway or corridor.	20			
d. Fourth level—Only storage space under overhanging gallery.	15			
e. Fifth level—Room 10 feet by 10 feet or less. Too small for large apparatus or seat storage.	5			
<i>Service Facilities</i>				
1. Dressing Rooms				325
(a) Boys' Activities				100
i. First level—Area of 20 square feet dressing and locker space per pupil in largest class. Adjoining gymnasium; width not more than twice ceiling height; 20 per cent window area; non-slip tile floor; glazed brick tile, or smooth face brick walls; readily accessible from athletic field.	50			

SCORE CARD FOR PHYSICAL EDUCATION FACILITIES
in the Junior and Senior High School

	Levels	1	2	3
2. Second level—Inferior to (a) in <i>one</i> essential respect. Either as to location (up or down stairs), or as to area per pupil, or per cent of window area, or type of walls or floors.	40			
3. Third level—Inferior to (a) in <i>two</i> essential respects: location, or area, or light, or finish.	30			
4. Fourth level—Inferior to (a) in <i>three</i> essential respects.	15			
5. Fifth level—Less than 10 square feet per pupil, less than 10 per cent window area and inconvenient location.	5			
(b) Girls' Activities.		50		
1. First level—Area of 20 square feet dressing and locker space per pupil in largest class. Adjoining gymnasium; width not more than twice ceiling height; 20 per cent window area; non-slip tile floor; glazed brick tile, or smooth face brick walls; readily accessible from athletic field.	50			
2. Second level—Inferior to (a) in <i>one</i> essential respect. Either as to location (up or down stairs) or as to area per pupil, or per cent of window area, or type of walls or floors.	40			
3. Third level—Inferior to (a) in <i>two</i> essential respects: location, or area, or light, or finish.	30			
4. Fourth level—Inferior to (a) in <i>three</i> essential respects.	15			
5. Fifth level—Less than 10 square feet per pupil, less than 10 per cent window area and inconvenient location.	5			
z. Shower Rooms.		100		
(a) Boys' Activities		50		
1. First level—Adjacent to locker room, easy of access from gymnasium, swimming pool and athletic field, separate from but adjoining locker room through a drying room; 14 square feet of floor area for each shower head. One shoulder height shower for each four boys in largest class. Non-slip tile floor and marble or tile walls, 20 per cent window area, copper covered frame and sash. Adequate ventilation and drainage.	50			
2. Second level—Inferior to (a) in <i>one</i> essential respect. Either as to location, or lack of drying, or inadequate size, or showers, or light.	40			
3. Third level—Inferior to (a) in <i>two</i> essential respects: location, or drying room, or size, or showers, or light.	25			
4. Fourth level—Inferior to (a) in <i>three</i> essential respects.	15			
5. More than ten boys for each shower.	5			
(b) Girls' Activities.		50		
1. First level—Easy of access from gymnasium, swimming pool and athletic field. Separate dressing booth and shower for each girl in the largest				

	Levels	1	2	3
class. Shoulder high showers arranged in rows under control of instructor with exhaust hoods above each double row of showers. Non-slip tile floors, marble partition walls, 20 per cent window area, copper covered frame and sash. Adequate heat, ventilation and drainage.	50			
2. Second level—Arranged as in (a) except that one shower is placed between each two dressing rooms.	40			
3. Third level—Same arrangement as first level for boys.	40			
4. Fourth level—Three or four dressing rooms for each shower head. A minimum of one shower for each six girls in largest class. Convenience of use, area per pupil, percentage of light, sanitation sacrificed through economy or poor planning.	20			
5. Fifth level—More than six girls for each shower.	10			
3. Team Room.				25
(a) Boys' Activities.			20	
1. First level—Space in main locker room for a sufficient number of large lockers so that the equipment issued to team members is safeguarded.				
2. Second level—One or two special dressing rooms of about 200 square feet area, located near the entrance and convenient to the showers, for the boys' visiting team, or home team, or both, equipped with benches and hooks or lockers.	20			
3. Third level—Same floor area set apart for the team as for the rest of the school. Two separate rooms as part of the physical education facilities, equipped with lockers, showers and toilet facilities. One each for boys' home team and boys' visiting team.	15			
	10			
(b) Girls' Activities.		5		
1. First level—Space in main locker room for a sufficient number of large lockers so that the equipment issued to team members is safeguarded.		5		
2. Second level—Special dressing rooms of 200 square feet area, located near the entrance and convenient to the showers for the girls' visiting team, and home teams, each equipped with benches and hooks or lockers.		3		
3. Third level—Same floor area set apart for the teams as for the rest of the school. Two separate rooms as part of the physical education facilities, equipped with lockers and toilet facilities. One each for girls' home team and girls' visiting team.		0		
4. Sanitary Features.			50	50
a. First level—Entrance to toilet room from shower as well as locker room. Outside light, tile floors and walls. One toilet for each 15 girls in largest class. One toilet and one urinal for each 25 boys in largest class. One lavatory for each 20 boys or girls.	50			
b. Second level—Toilet room connected with locker room or shower room but not with both. Otherwise as in (a)	40			

SCORE CARD FOR PHYSICAL EDUCATION FACILITIES
in the Junior and Senior High School

	Levels	1	2	3
c. Third level—As in (b) but one toilet for each 25 girls and one toilet and one urinal for each 50 boys.	30			
d. Fourth level—One toilet and one lavatory, irrespective of size of class.	10			
e. Fifth level—Toilet room of school not directly connected with service unit.	5			
5. Towel and Suit Facilities.				30
a. First level—Small room adjoining both dressing room and shower room from which clean towels and freshly laundered gymnasium or swimming suits may be served to users for each physical education period.	30			
b. Second level—Smaller room for towels located as part of the physical education unit.	20			
c. Third level—Storage closet for towels (frequently adjoining the school laundry) not part of the physical education unit.	10			
6. Drying Room for Athletic Clothing				20
a. First level—A room adjoining each locker room large enough to hold drying racks for a day's allotment of clothing for either football, or outdoor hockey. Over size exhaust ducts and extra radiation to provide rapid drying of clothing and elimination of odors.	20			
b. Second level—Storage space in connection with the physical education department where extra size lockers for football clothing may be placed.	5			

APPLICATION OF THE SCORE CARD

Tracings were made of the pencil sketches of the physical education facilities provided in the one hundred seven buildings from which blueprints were taken. No claim is advanced that each of these tracings is a true and complete picture of the facilities incorporated in the building it represents. Errors of omission were probably made when the sketches were copied from the plans on file with the state department. The draftsman who worked out the tracings from the pencil sketches overlooked some of the detail and misread some of the blurred figures. The reports from the principals who were assigned to these schools after they were built indicated that in some cases the building was not completed according to the plans on file but that changes were made during the construction. The most frequently reported change was in regard to the equip-

ment for showers and sanitary fixtures. The scoring then is of the facilities as shown on the tracings. Illustrations of four different levels for ten of the principal divisions such as director's office, location of gymnasium, the lighting of the gymnasium, bleacher arrangements, provision for storage of apparatus and portable seats, boys' locker and dressing rooms, boys' shower room, girls' shower room, sanitary facilities and team rooms will be found in this chapter.

These blueprints were scored by a state director of physical education, by a former state director (now an assistant professor of physical education), by a former city director (now a graduate student of physical education) and the writer. The average of the ratings to the nearest multiple of five was taken for the final score. For example, Departmental Offices, Boys' Facilities, M₂, which was scored 20, 20, 25 and 18 respectively, has been given a final score of 20. M₃ scored 25, 25, 20 and 22, has a final score of 25.

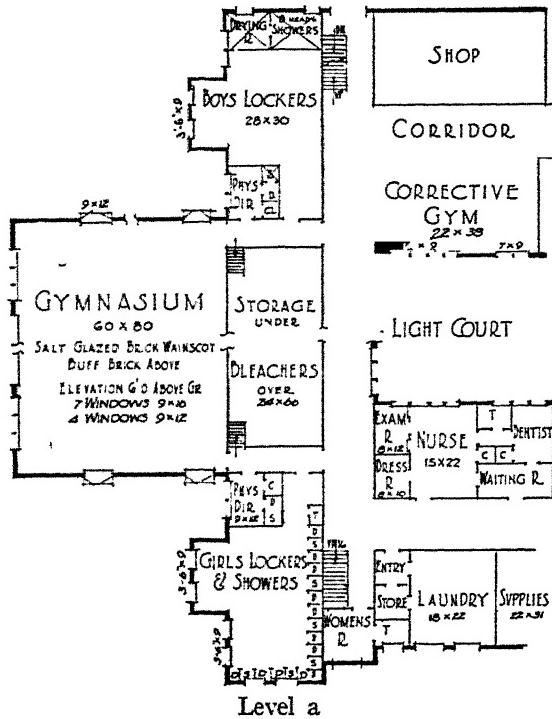
DEPARTMENTAL OFFICES

Table VIII on page 74 shows the scoring for the director's office, boys' activities. In the smaller buildings where only one director's office was shown it was scored as being the office for the director of boys' activities.

In only one building, New Jersey 15, was the director's office placed on the highest level by all scorers. One other building, New York 15 (illustrated on page 70), planned by the same firm of architects as New Jersey 15, was placed on the highest level by three. In all other cases, either because of inferior location, lack of service facilities, little or no outside window area, or inadequate size (in that order), the office facilities were on a lower level. There were twenty-four buildings in which no special provision was made for the director. Three of these were in Massachusetts, eight in New York, one in New Jersey and twelve in Pennsylvania. The median score for the director's office was at the third level for the Massachusetts buildings and between the third and fourth level for the buildings in the other three states.

PHYSICAL DIRECTOR'S OFFICE

Y₁₅ 1059-60



DEPARTMENTAL OFFICES

Physical Director's Office

Level a, New York 15. Cost \$1,150,000. Enrollment 1059. Size of largest physical education class, 60.

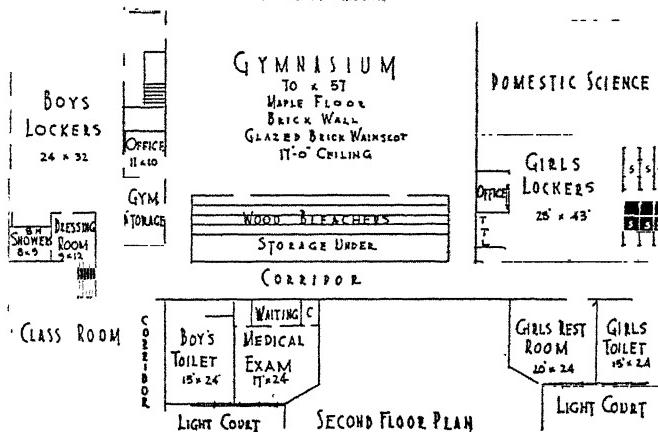
In this building, and in others planned by this firm of architects, the offices for the physical director are so located as to be in close touch with both the gymnasium and locker room with the outside window of the office overlooking the athletic field. Each office also has a closet and private dressing room with shower. This is one of the few buildings that included a corrective room with the other facilities provided for the physical education program.

The score for the facilities as a whole is approximately 600. The building lacks examination rooms, has a single gymnasium lighted on one side and ends, has permanent rather than folding bleachers; small, inadequately lighted dressing rooms, too few showers and sanitary fixtures for the size of the class.

PHYSICAL DIRECTOR'S OFFICE

J14640-48

5 - 9 x 14 WINDOWS



Level c

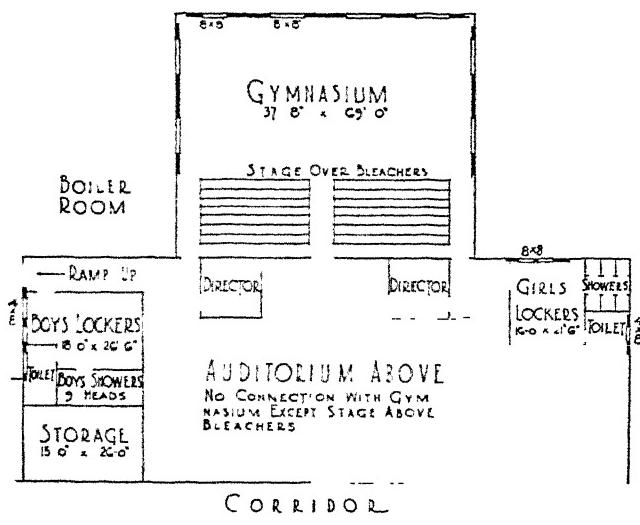
Level c, New Jersey 19. Cost \$400,000. Enrollment 640. Size of largest physical education class, 48.

In this building the offices are located adjoining both the gymnasium and the locker room but have neither outside light nor separate shower. The score of approximately 450 is due to the location of the gymnasium, its poor lighting, the lack of a corrective room and inadequate provision for dressing rooms and showers.

A good feature to be noted is the close connection between the physical education department and the rooms for the medical examination and girls' rest room.

PHYSICAL EDUCATION FACILITIES

PHYSICAL DIRECTOR'S OFFICE

P₇ 350-30

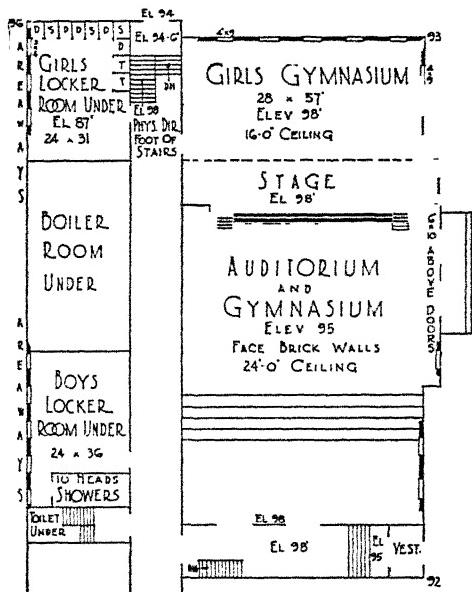
Level d

Level d, Pennsylvania 7. Cost \$350,000. Enrollment 350. Size of largest physical education class 30.

In this building the offices are rooms 14' by 14' without outside light or any special facilities as shower, toilet or closet. Neither is so located as to oversee either the gymnasium or locker room. The score of approximately 400, is lowered because of poor offices, lack of examination rooms or corrective room, inadequately lighted as well as too narrow a gymnasium, too small locker rooms with too few showers.

PHYSICAL DIRECTOR'S OFFICE

P.S. 500-25



Level e

Level e. Pennsylvania 5. Cost \$190,000. Enrollment 500. Size of largest physical education class, 25.

The desk of the physical education director at the foot of the stairs is but one of several poor features of this plan, which lowered the score to 350. The girls' gymnasium is shorter, narrower and lower than the minimum sizes of 60 by 40 by 18 feet. The locker and shower rooms are located across a main corridor and down stairs from the gymnasium seven feet below the outside grade level with small windows from an areaway. Three showers for girls, compared to ten for the boys shows lack of educational planning.

PHYSICAL EDUCATION FACILITIES

TABLE VIII

DIRECTOR'S OFFICE

*Physical Director's Office
Boys' Activities*

Level a, score 30; Level b, score 25; Level c, score 20; Level d, score 10;
Level e, score 5.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	0	20	15	15
2	20	20	10	25
3	25	0	15	25
4	25	15	15	15
5	20	0	25	0
6	20	15	15	0
7	15	25	15	10
8	0	25	15	15
9	20	15	0	0
10	20	0	20	0
11	15	25	25	15
12	25	25	20	0
13	25	15	15	0
14	15	15	10	15
15	0	30	30	20
16	15	0	25	15
17	20	15	15	20
18	20	15	15	0
19		20	20	20
20		0	15	20
21		0		20
22		25		15
23		0		0
24		0		15
25		25		15
26		20		0
27		25		15
28		15		20
29		20		0
30		20		0
31		15		15
32		15		20
33		15		0
34		20		20
35				20

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	0-25	0-30	0-30	0-25
1st Quartile	15	15	15	0
Median	20	15	15	15
3rd Quartile	25	25	25	20
Q	5	5	5	20

EXAMINATION ROOM

The three buildings that provided a special room for the physical examination (one in Massachusetts, one in New York and one in Pennsylvania) were each given 15 points out of the possible 25 that would have been allotted if they had been at the first level. In all three buildings they were too small to meet the indicated standard.

GYMNASIUM

NUMBER OF GYMNASIUMS

The amount allotted on the score card for the number of gymanasiums gives a higher rating to buildings having a small enrollment and a single gymnasium no matter how small, poorly lighted and inadequate, and a lower rating to buildings with a large enrollment than the other facilities of these buildings would seem to indicate that they deserve. In New York state a building with a total score of 175, was given 80 points because there is a gymnasium. This gymnasium is 13 feet below grade and has a ceiling 16 feet from the floor. It is 35 feet wide and has four small windows at one end with a glass area five per cent of the floor area. It is questionable whether such a basement should be classed as a gymnasium at all. In that same state the building that had the highest total score for physical education facilities with a large gymnasium (75 feet by 95 feet) for boys and another (45 feet by 76 feet) for girls was given 60 points for number of gymanasiums.

Another question that remains unanswered is "When does one gymnasium become two?" Is a net or canvas dropped from the ceiling at the center of the room evidence that the school has two gymanasiums? Or should a rolling partition, or folding doors be the required evidence that there are two rather than one? Should the fact that the sliding doors are so heavy that notice must be given

to the janitors in advance because of the difficulty involved in moving them be taken into consideration? In scoring these buildings unless the partitions were permanent, or the floors on different levels (one a stage or gallery for the other), the school was credited with the larger score for size of gymnasium rather than the larger score for having more than one.

Only in Massachusetts was the median score for number of gymnasiums as low as the third level. In New York the median score for all the buildings was at the second level while in the other two states the median score for number of gymnasiums in proportion to the school enrollment came between the second and third levels. See Table IX, below, for the scores allotted to all the buildings.

TABLE IX
GYMNASIUM FACILITIES
Number of Gymnasiums

Level a, score 85; Level b, score 70; Level c, score 60; Level d, score 40;
Level e, score 25.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	80	55	85	15
2	70	70	55	35
3	55	80	65	40
4	20	25	60	80
5	60	75	60	85
6	70	80	70	85
7	50	85	70	80
8	70	80	40	85
9	60	60	70	70
10	20	75	85	80
11	75	60	65	55
12	20	20	60	75
13	55	70	70	70
14	70	60	70	80
15	50	30	60	65
16	25	70	85	65
17	40	80	25	25
18	70	70	20	80
19		40	60	55
20		75	70	40

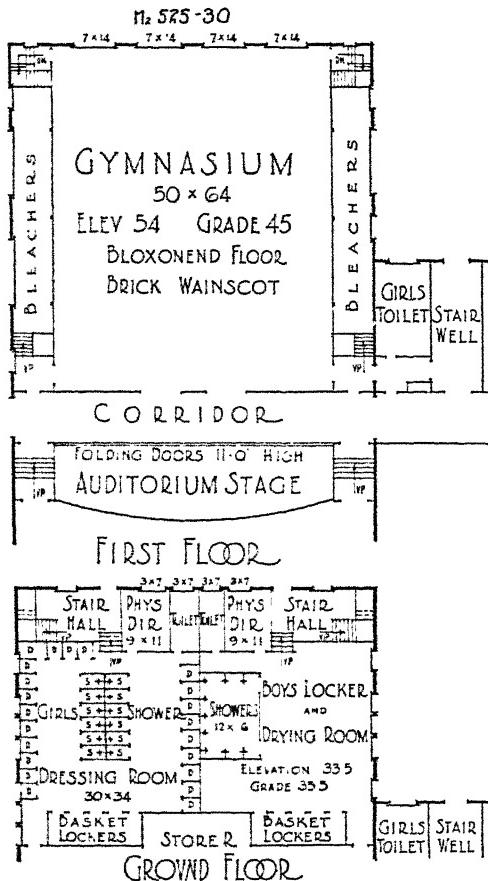
BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
21		65		25
22		55		60
23		80		70
24		80		65
25		60		60
26		60		80
27		80		70
28		70		30
29		70		25
30		35		85
31		80		70
32		40		60
33		70		80
34		60		40
35				20
Range	20—80	20—85	20—85	15—85
1st Quartile	40	60	60	40
Median	60	70	65	65
3rd Quartile	70	80	70	80
Q	15	10	5	20

LOCATION OF GYMNASIUMS

Three of the Massachusetts gymnasiums, two in New York, one in New Jersey and one in Pennsylvania, seven of the 107, were considered to be at the highest level for location. Three in Massachusetts, four in New York, two in New Jersey and eight in Pennsylvania were of the "hole in the ground" type. Only in New Jersey was the median score for location as high as level c and in Pennsylvania the median score was down to the d level.

The illustrations in this chapter show the wide variety of practices used by the different architects in placing the gymnasium.

LOCATION OF GYMNASIUM



Level a

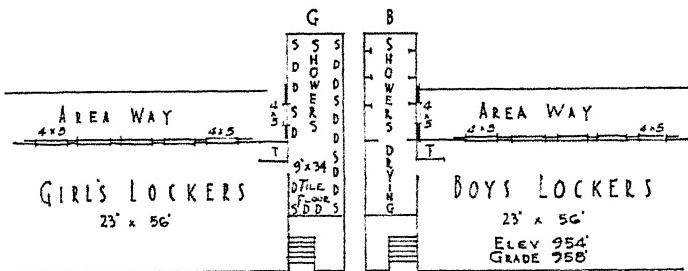
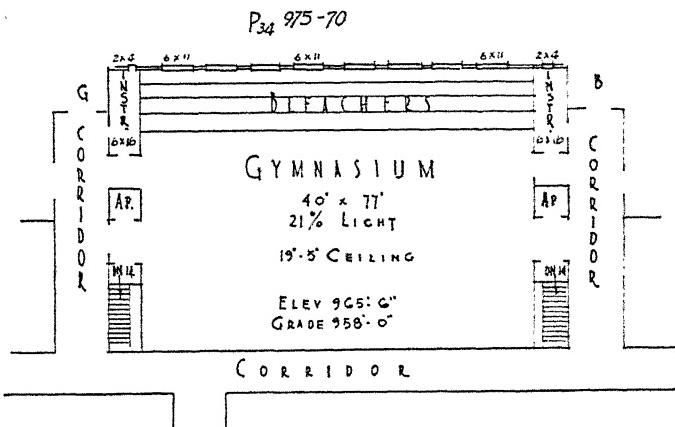
Location of Gymnasium

Level a, Massachusetts 2. Cost \$387,000. Enrollment 525. Size of largest physical education class, 30.

This building was one of the two in Massachusetts, both by the same architect, where the window area was over 20 per cent of the floor area. Some good features beside the lighting are the brick wainscot wall with sound reducing plaster above, the small amount of space given to permanent bleachers, the well lighted locker rooms ample in size.

The score was lowered to approximately 600 because of the lack of corrective and examination rooms, inadequate storage area and few showers.

LOCATION OF GYMNASIUM



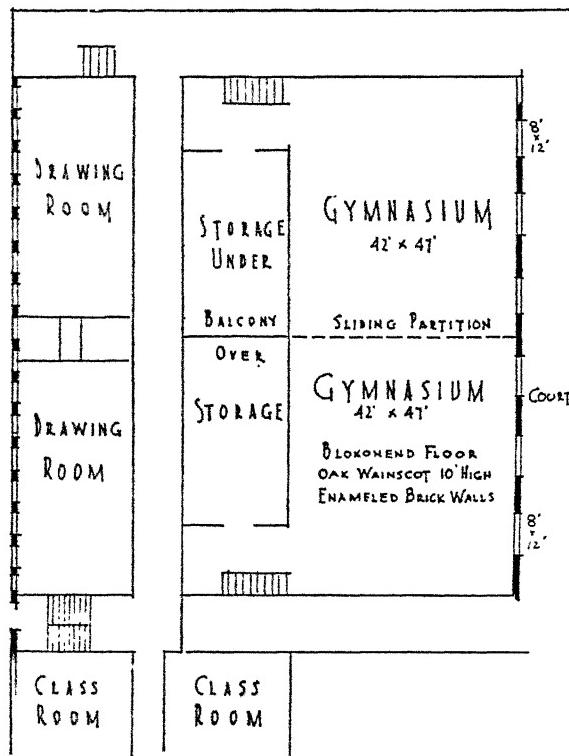
Level b

Level b, Pennsylvania 34. Cost \$300,000. Enrollment 975. Size of largest physical education class, 70.

This gymnasium has light on but one long axis but the windows were so arranged that the light area was over 20 per cent of the floor area. Except for the lighting of the gymnasium the various items included in the scoring ranked low. No provision is made for an examination or corrective room. The offices of the directors are only six feet in width, without service facilities, poorly lighted and located. There is but one gymnasium for an enrollment of almost 1,000 pupils. The locker rooms are adequate in size but with less than 10 per cent light. There are only six showers for boys and seven for girls for large classes of 70. The score is approximately 375.

LOCATION OF GYMNASIUM

J-900-60

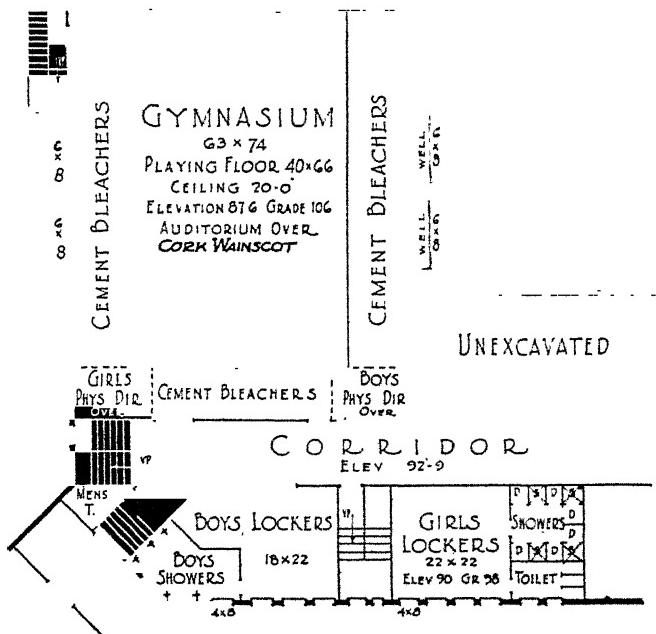


Level c

Level c, New Jersey 2. Cost \$600,000. Enrollment 900. Size of largest physical education class, 60.

The gymnasium in this building is so located that the light comes from a court with the window area 14 per cent of the floor area. The wall of the gymnasium is the only item on the a level. The departmental offices and service facilities are not shown in the illustration. The total facilities score 435.

LOCATION OF GYMNASIUM

Y₄ 1055-45

Level e

Level e, New York 4. Cost \$278,000. Enrollment 1,050. Size of largest physical education class, 45.

This gymnasium, located under the auditorium, lighted by four small windows, two of them in areaways, has a window area but six per cent of the floor area. The low score of approximately 250 given to this building is due to many inadequate features: A single gymnasium for a thousand pupils, large area given to permanent bleachers, lack of storage space, locker and shower rooms located up a flight of stairs and across a corridor from the gymnasium, small number of showers.

TABLE X

GYMNASIUM FACILITIES

Location of Gymnasiums

Level a, score 60; Level b, score 50; Level c, score 30; Level d, score 20;
Level e, score 10.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	5	20	15	15
2	60	50	25	20
3	20	50	20	30
4	30	10	20	60
5	20	20	55	20
6	30	35	30	15
7	55	60	40	35
8	10	15	30	25
9	20	40	10	0
10	25	10	55	20
11	15	55	20	10
12	60	25	10	15
13	60	20	50	15
14	25	40	30	15
15	20	55	60	30
16	25	5	50	15
17	50	40	50	25
18	10	20	20	25
19		30	30	10
20		20	20	30
21		20		20
22		15		25
23		20		25
24		10		20
25		30		10
26		20		20
27		25		10
28		15		55
29		30		10
30		50		10
31		20		10
32		25		30
33		20		30
34		60		50
35				30

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	5—60	5—60	10—60	0—60
1st Quartile	20	20	20	15
Median	25	25	30	15
3rd Quartile	50	40	50	30
Q	15	10	15	7.5

SIZE AND HEIGHT OF GYMNASIUMS

As was pointed out in giving the rating for each of these buildings it is not easy to score the gymnasium for size. Not only is it difficult to determine when one gymnasium becomes two but it is also difficult to rate a gymnasium that differs in size from the usual ratio of approximately two to three for relation of width to length. Should a floor 40 feet by 82 feet (M_1) be scored higher than one 40 by 60? Should a floor 50 feet by 64 feet (M_2) be rated as between level b (50 by 80) and level c (45 by 70) or between level c and level d (40 by 60)? One of the scorers placed it at 40, below level c, two at 50 (level c), and one at 55. The average of the four would put it at level c. A more serious problem occurs when there is a marked difference between the size of the gymnasium for girls and the one provided for the boys. Usually when there are two gymnasiums the one for the girls is a duplicate of the one provided for the boys but in the few cases where a difference was made the smaller room with lower ceiling was assigned to the girls.

In sending out the score card for evaluations particular attention was called to level e under size and height of gymnasium and to the fact that in about one sixth of these new buildings the gymnasium is either less than 40 feet in width, or less than 18 feet high, or both narrower and lower than these minima. The question was asked "Of what value is a narrow, or low, gymnasium?" Those who had had experience with narrow gymnasium recommended subtracting as much as four points for each foot in width less than 40. Those who had been required to conduct classes in a gymnasium with a low ceiling took off more for a low ceiling than for a narrow room. The wide range in values given to level e by those who evaluated the score card (9 — 30, Q_1 10, Q_3 25. M_1 15) probably reflects their experience, or lack of it, with a gymnasium less than the minimum size. It will be seen from Table XI, page 84, that in each state there

was a wide range in the score given for size and height. Two of the eighteen buildings in Massachusetts were in the lowest level and one above the second level. Of the thirty-four New York state buildings two were in the lowest level and three above the second level and two were placed in the lowest. Seven of the thirty-five Pennsylvania buildings were placed at the lowest level, four as between the second and the first and two as at the highest level. The median for all four states is approximately at the third, or c level, the median for the Massachusetts buildings being slightly below this level.

TABLE XI
GYMNASIUM FACILITIES

Size and Height of Gymnasium

Level a, score 75; Level b, score 65; Level c, score 50; Level d, score 30;
Level e, two points from 30 for each foot less than 60 in length,
40 in width or 18 in height.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	35	40	55	55
2	50	20	40	55
3	50	30	25	65
4	60	40	30	25
5	20	35	15	15
6	55	40	60	40
7	65	30	50	25
8	15	45	35	40
9	55	60	55	60
10	60	40	55	20
11	45	30	50	30
12	65	55	50	35
13	70	30	45	65
14	35	60	60	20
15	30	70	65	65
16	65	45	50	55
17	55	55	40	75
18	50	35	45	50
19		60	45	30
20		30	30	70
21		60		65
22		65		70
23		40		50
24		5		50
25		65		50

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
26		50		20
27		35		20
28		30		75
29		40		35
30		70		50
31		60		30
32		65		45
33		45		70
34		75		45
35				70
Range	15—70	5—75	15—65	15—75
1st Quartile	35	35	35	30
Median	55	45	50	50
3rd Quartile	65	60	55	65
Q	15	12.5	10	17.5

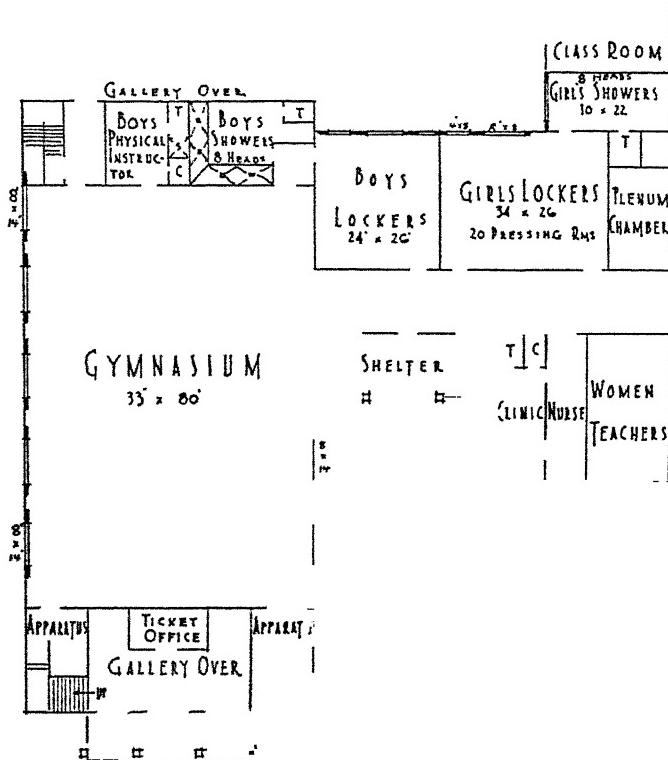
LIGHT FOR GYMNASIUMS

A comparison of Table XII, on page 90, with the standards for light set up by those who are to carry on the educational program shows how few of these gymnasiums are adequately lighted. Two of the eighteen in Massachusetts are at the first and two at the second level. That is, they have 20 per cent or more window area without depending upon skylights or areaways. Nine of the thirty-four in New York, six of the twenty in New Jersey and but three of the thirty-five in Pennsylvania are as well lighted.

The median gymnasium in Massachusetts is at the fourth level. For New York and New Jersey the median falls between the fourth and fifth level and in Pennsylvania in more than half of the gymnasiums the window area was less than ten per cent of the floor area.

One reason for the criticism that educators have of the frequently used plan of locating the gymnasium under the auditorium is clearly shown in this group of buildings. Thirty of the 107 were so located. In six of these the window area was less than five per cent of the floor area. In ten the windows were from five to nine per cent, in nine from ten to fourteen per cent, and in five of the thirty the window area was from fifteen to twenty per cent. In only one of the gymnasiums located under the auditorium did the window area equal the minimum standard twenty per cent of the floor area.

LIGHT FOR GYMNASIUM

J₅ 700-64

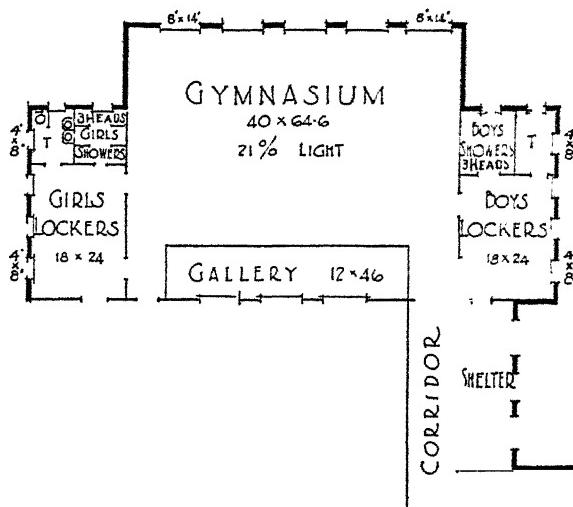
Level a

LIGHT

Level a, New Jersey 5. Cost \$675,000. Enrollment 700. Size of largest physical education class, 64.

This building is one of the few of the 107 included in this study that had windows on the two long axes of the gymnasium. The score for the physical education facilities is reduced to approximately 425 because of the lack of examination and corrective rooms, a lack common to almost all of these buildings, and also because of the narrow gymnasium, the location and size of the locker rooms, the small number of showers, eight for boys and four for girls, and few toilet fixtures in the locker and shower rooms.

LIGHT FOR GYMNASIUM

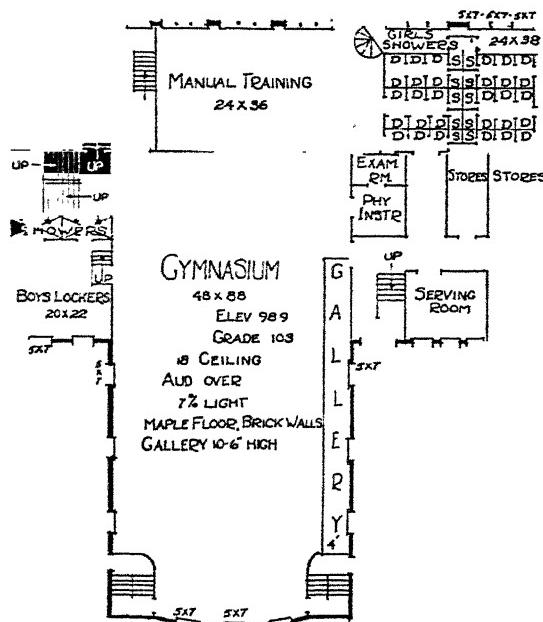
Y₃ 90-26

Level b

Level b, New York 3. Cost \$165,000. Enrollment 90. Size of largest physical education class, 26.

This building, by the same architect as Level a, New Jersey 5, has many of the same characteristics and scores somewhat higher, approximately 460, although costing less than one-fourth as much. The light is from the one long axis but over 20 per cent of the floor area. There is no provision for offices, and the showers, three for boys and three for girls, are inadequate for class use. The locker rooms have 20 per cent window area and adjoin the gymnasium.

LIGHT FOR GYMNASIUM

M_u 334-35

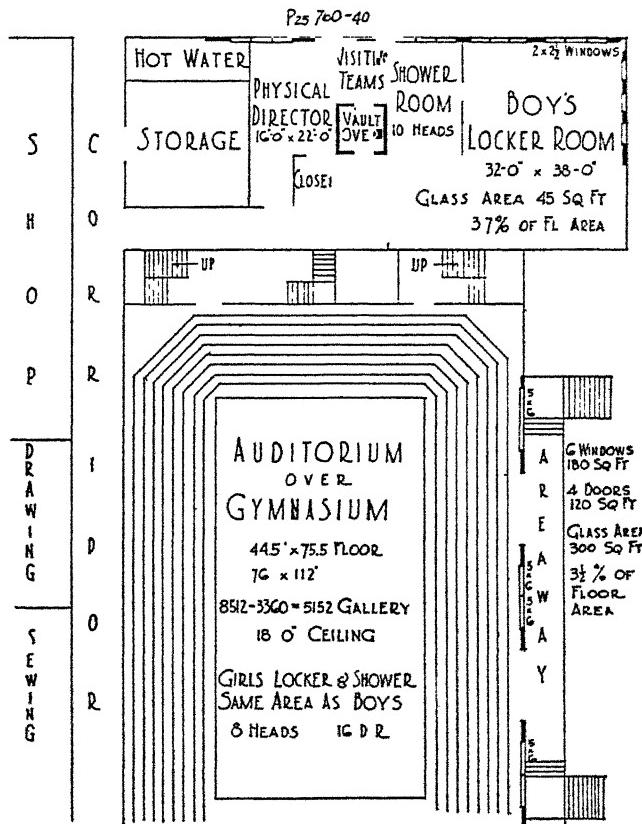
Level d

Level d, Massachusetts 11. Cost \$270,000. Enrollment 334. Size of largest physical education class, 35.

Although the windows are on the two long axes of the gymnasium they are so located and so small that the window area is but seven per cent of the floor area.

The facilities scored approximately 400 points. The location of the gymnasium and its lighting are at the e level, the shower rooms and bleacher space at the d level, with no items at the a level except that there is one gymnasium for an enrollment of less than 350 pupils.

LIGHT FOR GYMNASIUM



Level e

Level e, Pennsylvania 25. Cost \$400,000. Enrollment 760. Size of largest physical education class, 40.

The desire to provide for games and the team is very evident in this building. The bleacher area is a half larger than the playing area. The windows are but three and one half per cent of the floor and located on an areaway. The locker rooms for both boys and girls are poorly lighted. No item scored higher than level c and three items, location, light and bleacher space, are on the lowest level. The total score is approximately 360.

TABLE XII

GYMNASIUM FACILITIES

Light for Gymnasium

Level a, score 50; Level b, score 40; Level c, score 30; Level d, score 20;
Level e, score 10.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	10	40	15	15
2	50	40	15	10
3	10	40	15	10
4	20	5	15	50
5	20	30	45	15
6	20	15	15	15
7	20	50	15	30
8	5	5	30	30
9	40	15	10	0
10	20	5	45	40
11	10	40	15	5
12	50	15	10	5
13	40	15	40	10
14	30	15	30	10
15	15	40	15	15
16	20	5	40	5
17	15	10	40	15
18	10	40	40	10
19		15	15	5
20		15	15	20
21		15		10
22		10		15
23		15		10
24		5		15
25		15		5
26		15		20
27		15		5
28		10		30
29		15		30
30		40		10
31		15		10
32		15		10
33		15		15
34		50		40
35				10

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	5—50	5—50	10—45	0—50
1st Quartile	10	15	15	10
Median	20	15	15	10
3rd Quartile	30	40	40	20
Q	10	12.5	12.5	5

WALLS

The scoring given to the walls of the gymnasium in this study does not indicate the range that would be shown if all of the data were available. For most of the buildings (85 out of 107) the plans called for a brick wall without showing whether the bricks were glazed, face brick, or common. For all of these a score of 15 was given (level c). The specifications in many instances called for alternate bids for different types of walls. Probably if the principal for each building had reported upon the kind of brick that had been used, some of these walls would have been at level b and possibly a few at level a. The correspondence with the directors and professors who evaluated the different levels for the score card as well as their ratings indicated that there was no general agreement regarding the material considered desirable for the best type of wall surface. Some emphasized the importance of a hard, smooth wall for hand ball, others placed more emphasis upon the value of a surface that would not show marks, while still others pointed out the value of a wall that would absorb some of the sound.

FLOORS

Since only eight of the plans for these buildings specified a floor that varied from the almost universal requirement of maple most of the floors were given a score of 40 or level c.

BLEACHERS

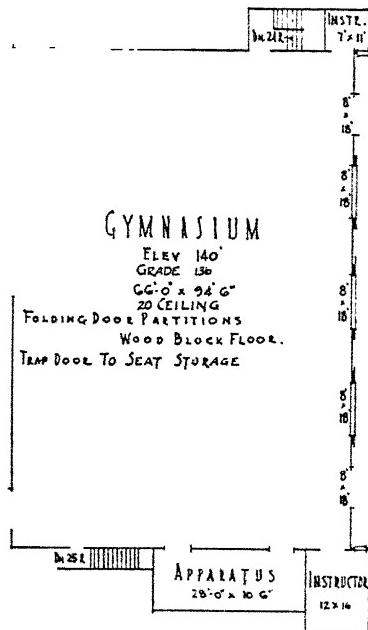
As was pointed out in Chapter II, these 107 buildings show great differences in the provision made for spectators at public games. This divergence reflects the attitude of those who are responsible for the physical education program. On page 150 is a quotation from the Michigan bulletin on school buildings that it is a fatal mistake to construct a gymnasium that does not have room for spectators fol-

lowed by one from Missouri that it is a waste of space and money to provide excessive room for bleachers used only a few times a year. Those who evaluated the score card criticized the descriptions of the different levels due to the differences of opinion regarding the amount of space that should be given to the bleachers, their location (whether starting at floor level, or in galleries) and whether they should be removable or permanent. The scorer, who would give but 25 out of a total of 1,000 points to the provision for bleachers (Table VI, page 56) and the one who would give 150 points were both city directors each responsible for the physical education program of several thousand high school pupils.

Each page of floor plans, as well as those labeled Bleachers on pages 93 to 96, shows how the provision for spectators varied in type, size, location and height above the floor level.

The different arrangements were difficult to score. What score should be given to a building with galleries on the ends rather than the two long sides? How should one score combinations of removable bleachers and galleries? What is the evidence that the school was planned for "removable bleachers to be placed on the floor when needed"? In the latter case it was taken for granted that if the gymnasium had adequate width to place bleachers on the sides and storage space for bleachers seats the plan should be scored at the second level even if the floor plan was not labeled portable bleachers and the storage space labeled as being designated for seats. Although the range of scores in all four states was from the second to the fifth level the spread between the first and third quartiles was less than for any of the other facilities scored.

BLEACHERS

P₃₅ 1800-70

FIRST FLOOR PLAN

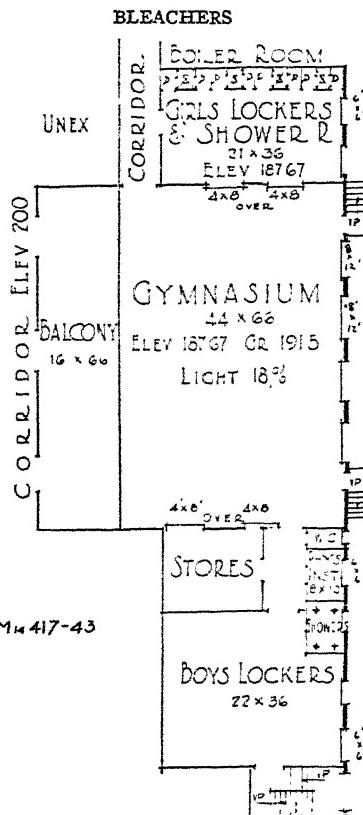
Level b

BLEACHERS

Level b, Pennsylvania 35. \$950,000. Enrollment 1,800. Size of largest physical education class, 70.

The entire floor area of this gymnasium is used for educational activities, provision for spectators at games being made by erecting portable bleachers that are stored under the gymnasium floor. See illustration, Level c, Sanitary Facilities, page 130.

The facilities as a whole scored approximately 485 points. A rating of either level a or level b was given to the gymnasium for size, bleacher arrangements, storage facilities, for team room, shower rooms (20 showers for boys and 26 for girls) and towel and suit facilities. Two items, light for the gymnasium (12 per cent) and number (one gymnasium with folding partitions for 1,800 pupils) are on the e level.



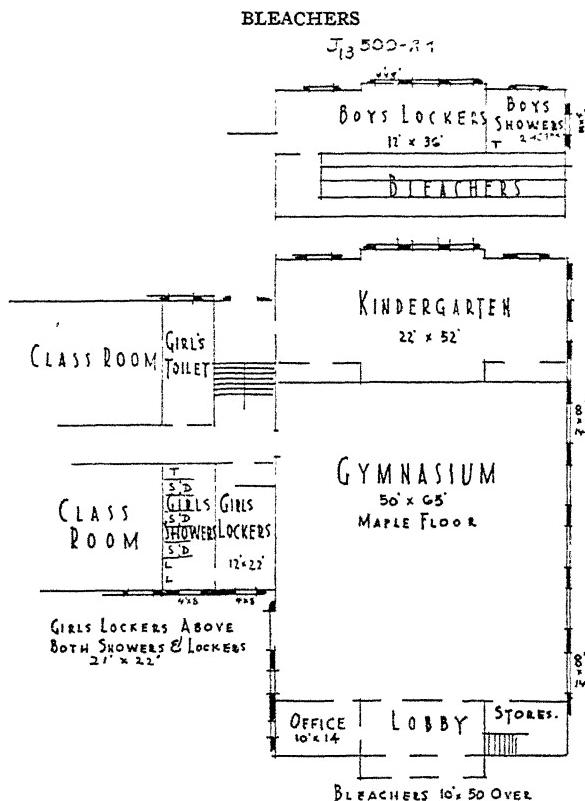
Level c

Level c, Massachusetts 14. Cost \$300,000. Enrollment 417. Size of largest physical education class, 43.

The balcony area is more than a third the area given to the gymnasium proper which has but little more than the minimum size of 40 by 60 feet.

The facilities as a whole score approximately 400. The more commendable features, level a or b, being the lighting of the gymnasium, provision for storage and the location, lighting, and size of the locker rooms.

The least commendable features, level e, are the small number of showers for girls and inadequate toilet provision in the locker and shower rooms.

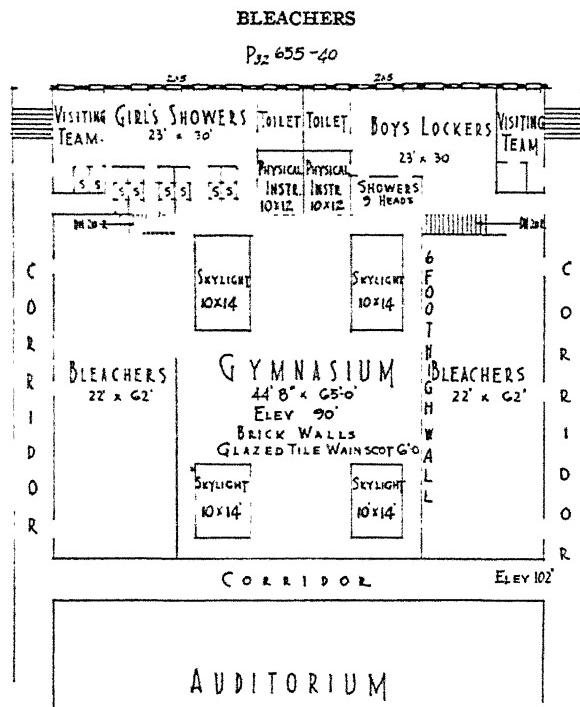


Level d

Level d, New Jersey 13. Cost \$425,000. Enrollment 500. Size of largest physical education class, 24.

A very common method of providing bleacher space is to take advantage of the extra height of the gymnasium by using eight to twelve feet for class room, locker rooms, offices, lobby, etc., and then place bleachers above. It is quite generally agreed that only those in the first and second rows can see much of what takes place on the floor below.

This building rated approximately 425 on its physical education facilities. No item was placed on the a level and only the boys' showers on the e level. The locker room and shower room for the girls as well as the bleachers are on the d level.



Level e

Level e, Pennsylvania 32. Cost \$305,000. Enrollment 655. Size of largest physical education class, 40.

The bleacher area in this building equals the playing area with the front wall of the bleachers six feet above the playing floor. The facilities for the building as a whole score approximately 380. The only item placed at level a is the wall which has a glazed brick wainscot with brick wall above. The team room and sanitary features in the shower and locker rooms are on the second level.

Besides the bleachers, the shower room for girls with only six showers and the lighting of the gymnasium, entirely by skylights, are on the e level.

TABLE XIII
GYMNASIUM FACILITIES

Bleachers

Level a, score 40; Level b, score 30; Level c, score 20; Level d, score 20;
Level e, score 10.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	20	10	25	10
2	20	20	20	20
3	20	20	20	20
4	30	15	20	0
5	0	25	20	20
6	25	20	20	0
7	30	0	25	20
8	15	25	20	20
9	30	30	10	20
10	25	25	20	10
11	15	20	20	30
12	30	15	15	20
13	30	15	20	20
14	25	30	20	20
15	20	25	25	20
16	20	25	20	20
17	20	15	20	20
18	0	15	10	20
19		15	20	10
20		10	10	20
21		20		30
22		20		20
23		0		20
24		0		10
25		20		10
26		20		10
27		15		20
28		20		30
29		0		10
30		20		20
31		25		10
32		20		10
33		15		25
34		30		20
35				30

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	0—30	0—30	10—25	0—30
1st Quartile	20	15	20	10
Median	20	20	20	20
3rd Quartile	30	25	20	20
Q	5	5	0	5

CORRECTIVE GYMNASIUMS

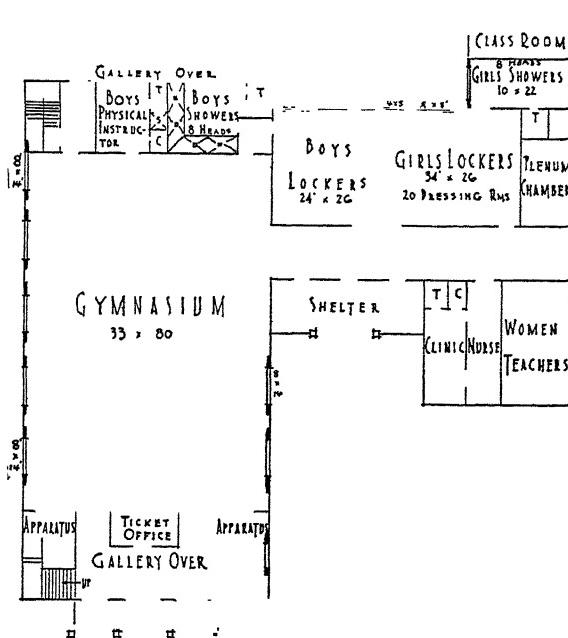
In Chapter II it was stated that in only three of these buildings was it indicated on the plans that special provision was to be made for corrective work. The judges scoring the one in New Jersey gave it half credit because of the inadequate lighting and gave one hundred points out of the possible 125 to each of the two buildings in New York with corrective gymnasiums.

APPARATUS AND STORAGE ROOMS

The range of scores for apparatus and storage was from zero to full credit in each of the four states. The range between the first and third quartiles was also large in all four states extending from the second level to the lowest in Massachusetts and New Jersey, from the second level to no provision at all in New York, and from slightly above the third level to zero in Pennsylvania. The median score for all four states was at next to the lowest level.

Taking the plans as a whole it was clearly evident that in general an area was labeled storage when its location, lack of outside light, or odd shape made it unsuitable for some other purpose.

APPARATUS AND STORAGE

J₅ 700-64

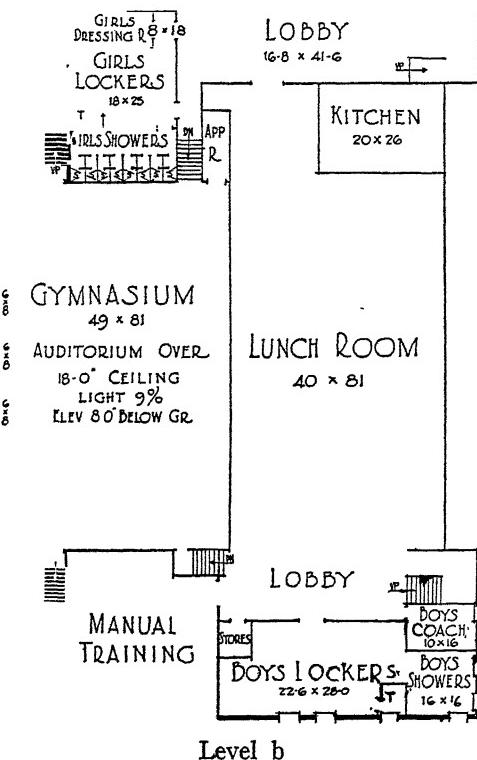
Level a

Level a, New Jersey 5. Cost \$675,000. Enrollment 700. Size of largest physical education class, 64.

This building, which was also used as an illustration for level a, light for the gymnasium, is one of the few buildings in the group of 107 where separate provision is made for seats and apparatus storage with both on the gymnasium floor level, wide doors and outside light.

Only the apparatus and storage facilities in this building are placed at the a level. The total score for facilities is 430.

APPARATUS AND STORAGE

M₁₈ 552 - NONE

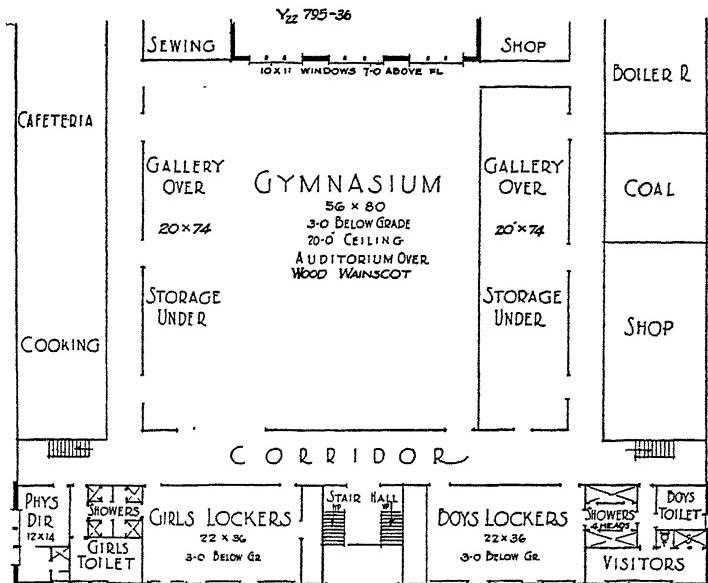
Level b

Level b, New York 25. Cost \$650,000. Enrollment 700. Size of largest physical education class, 40.

Besides the ample facilities for storage of both large and small equipment, the facilities on the b level are the offices for the directors, ample in size and well equipped, the large gymnasium, and the boys' and girls' locker rooms, at grade level although under the gymnasium.

No item was placed at the e level. The approximate score for the facilities as a whole is 475.

APPARATUS AND STORAGE

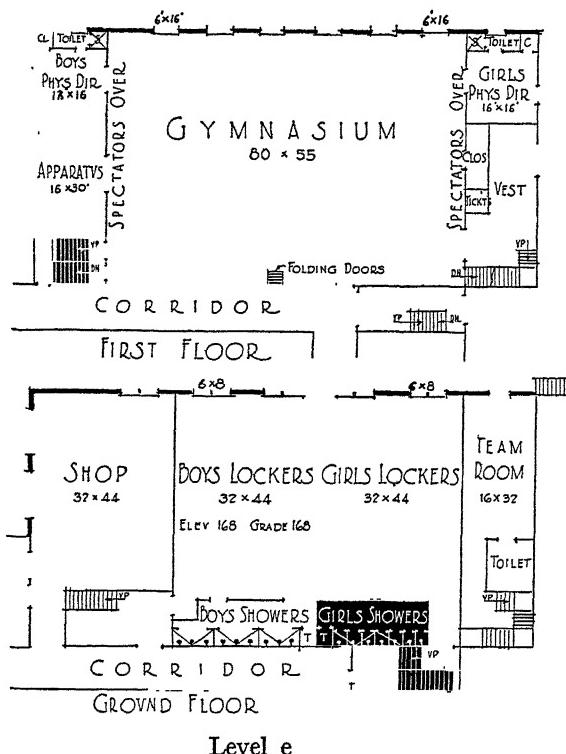


Level c

Level c, New York 22. Cost \$300,000. Enrollment 795. Size of largest physical education class, 36.

Using the space under the permanent bleachers for storage is a very common practice. There is plenty of space but it is seldom ventilated, or lighted and if the front wall comes down to the floor level the entrance to the store room must be at the end or out in the corridor. For the facilities as a whole the walls for the gymnasium and also providing drying rooms for athletic clothing at the end of the girls' and the boys' locker rooms are considered at the a level. The location of the gymnasium, its window area of eight per cent and the four showers for girls are given a level e rating. The total score is approximately 450.

APPARATUS AND STORAGE

Y₂₅ 700-40

Level e

Level e, Massachusetts 18. Cost \$390,000. Enrollment 552.

Because the principal of this building reported that the entire physical education program was given over to after school outside activities and there were no organized classes this building has been difficult to score on the basis of facilities provided for classes of definite enrollment.

The space labeled apparatus room on the plan is too small for anything except small equipment. Note also the location of the boys' lockers, up a flight of stairs and across the lobby of the lunch-room from the gymnasium.

The approximate score if the school had classes of the usual size in schools enrolling 500 pupils would be a little over 300.

TABLE XIV

GYMNASIUM FACILITIES

Apparatus and Storage Rooms

Level a, score 50; Level b, score 40; Level c, score 20; Level d, score 15;
Level e, score 5.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	0	0	35	20
2	10	5	20	40
3	45	0	5	25
4	35	0	30	20
5	15	0	50	0
6	0	50	15	0
7	35	45	20	15
8	5	0	15	20
9	0	5	0	0
10	45	0	40	5
11	25	0	30	25
12	40	0	10	20
13	5	20	25	0
14	40	0	5	15
15	0	40	35	40
16	15	0	0	10
17	50	40	35	50
18	5	50	0	0
19		20	25	40
20		40	0	0
21		0		45
22		15		20
23		0		30
24		0		0
25		40		20
26		0		20
27		35		0
28		15		30
29		0		5
30		10		15
31		35		0
32		35		0
33		20		0
34		40		5
35				40

PHYSICAL EDUCATION FACILITIES

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	0—50	0—50	0—50	0—50
1st Quartile	5	0	5	0
Median	15	10	15	15
3rd Quartile	40	40	35	25
Q	17.5	20	15	12.5

SERVICE FACILITIES

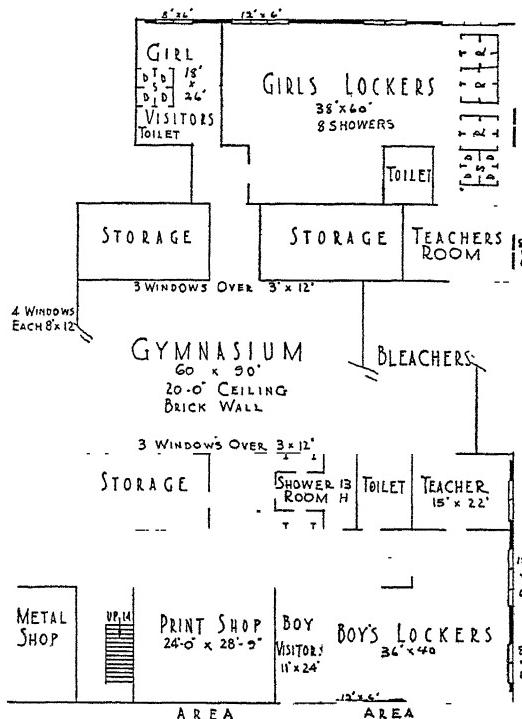
DRESSING ROOMS

Boys' Activities

In all four states except Massachusetts illustrations might have been taken for each of the five levels as described on the score card. In Massachusetts the middle half of the buildings scored no higher than the c level but all were higher than the d level. Expressed another way only three of the eighteen scored as low as the fourth level and no building was scored as being up to the second level. New York had eleven of the thirty-four scoring at the fourth level, or below, with two above the second level. In New Jersey and Pennsylvania in more than a third of the cases the score for the dressing rooms was at the fourth level or lower while in each there were several buildings at or above the second level.

If the locker room was placed adjacent to the gymnasium on the same floor level the amount of floor space per pupil usually was less than the 20 square feet of dressing and locker space. When the locker room was placed under the gymnasium the score was usually lowered because of inadequate light.

BOYS' DRESSING ROOMS

P₁₇1100-45

Level b

Level b, Pennsylvania 17. Cost \$650,000. Enrollment 1,100. Size of largest physical education class, 45.

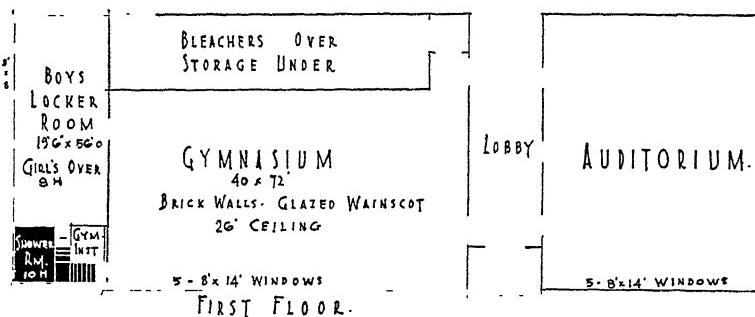
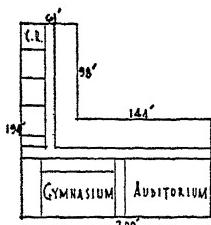
The building where the dressing room planned for the boys received the highest score of any of the 107 included in this study is New York 3 used as an illustration of level b in lighting. No other building reached the standard for location, area per pupil, per cent of window area as listed under level a.

In Pennsylvania 17 the locker room is close to the gymnasium, on the same floor level, has over 30 square feet for each pupil, 13 per cent window area.

This building was rated as level a or b for size of gymnasium, provision for storage, dressing rooms and team rooms. It was given level d or e rating for gymnasium, number and light, and for the girls' shower room. The approximate score is 485.

BOYS' DRESSING ROOMS

JUL 11 1950-70



Level c

Level c, New Jersey 17. Cost \$425,000. Enrollment 1,150. Size of largest physical education class, 70.

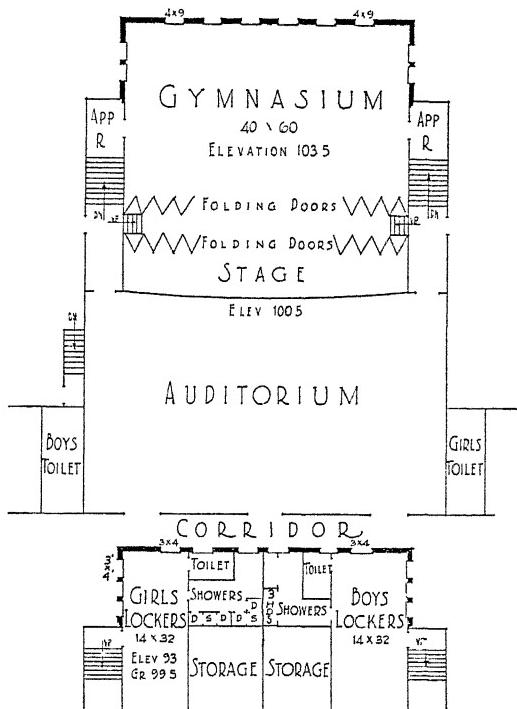
Dividing the height of the gymnasium between the boys' and girls' locker rooms placing one over the other was found to be almost as common a practice as having the locker rooms under the bleachers. Because of the large class size due to the single gymnasium, the area per pupil, including space used for lockers, is 16 square feet. The window area is 20 per cent of the floor area.

This building was given level a or b rating for the location, light and walls of the gymnasium and the provision for storage. The single gymnasium for over 1,100 pupils and the small number of showers were rated as at either d or e level.

The approximate score is 400.

BOYS' DRESSING ROOMS

YR0 366-42



Level d

Level d, New York 20. Cost \$224,000. Enrollment 386. Size of largest physical education class, 42.

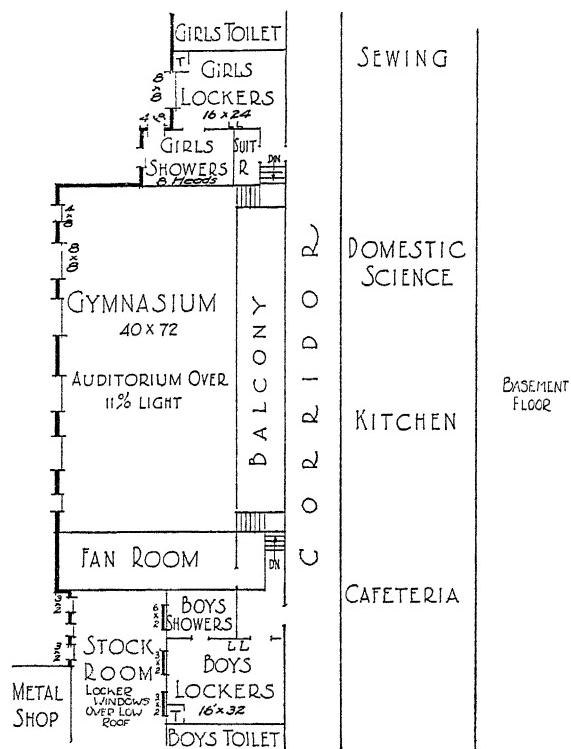
The location of the locker room under the gymnasium six feet below the grade elevation, the less than ten per cent light and small area per pupil placed the locker room at the d level.

For the building as a whole the provision for storing apparatus and sanitary features in the locker and shower rooms were at level a or b, while the location, size, light, dressing rooms and shower rooms were at either level d or level e.

The approximate score for the total facilities provided is 330.

BOYS' DRESSING ROOMS

115 795-70



Level e

Level e, Massachusetts 15. Cost \$354,000. Enrollment 795. Size of largest physical education class, 70.

Only the provision for towels and suits in the girls' locker room received a level b rating and no item was scored as of level a. Eight items: the location, size, light and bleachers of the gymnasium, the lockers and shower rooms and sanitary features scored at the d or e level. The approximate score is 360, the lowest for any of the eighteen Massachusetts buildings included in the study.

TABLE XV
DRESSING ROOMS
Boys' Activities

Level a, score 50; Lebel b, score 40; Level c, score 30; Level d, score 15;
Level e, score 5.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	35	25	35	15
2	35	10	30	40
3	20	50	5	40
4	10	15	25	25
5	30	10	25	35
6	35	40	25	15
7	25	35	15	25
8	20	15	30	15
9	30	10	10	5
10	25	30	50	10
11	30	5	45	20
12	30	30	20	20
13	25	25	35	15
14	30	25	15	5
15	5	35	40	40
16	30	10	30	10
17	35	35	40	45
18	15	30	10	10
19		20	30	35
20		15	15	30
21		25		30
22		40		20
23		35		30
24		5		35
25		35		35
26		30		25
27		45		10
28		20		40
29		30		15
30		15		30
31		20		5
32		30		15
33		15		20
34		35		35
35				30

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
Range	5—35	5—50	5—50	5—45
1st Quartile	20	15	15	25
Median	30	25	25	25
3rd Quartile	30	35	35	35
Q	5	10	10	10

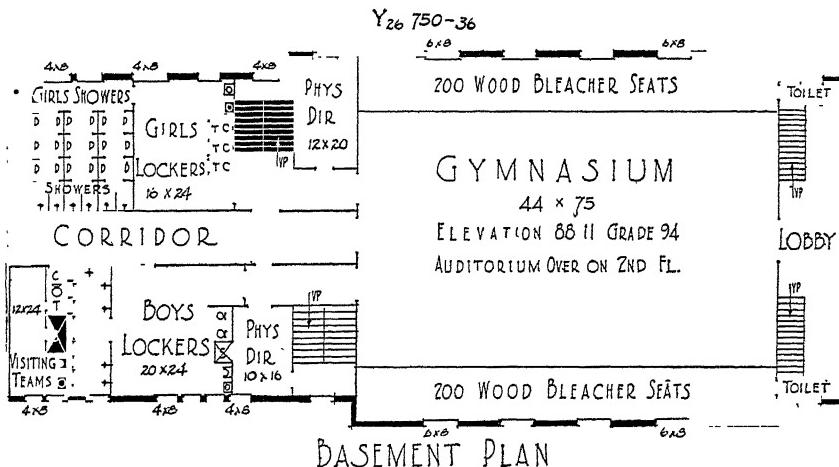
SHOWER ROOMS

Boys' Activities

The tabulation of scores given to the shower room in the different buildings shows in another way the same spread as was indicated in the analysis given in Chapter II of the different standards held regarding the number and kind of showers. Only one building in Massachusetts, six in New York, two in New Jersey, and seven in Pennsylvania were scored as being as high as the second level, while thirteen in New York, seven in New Jersey, and six in Pennsylvania were at the lowest level. In but two of the four states, Massachusetts and Pennsylvania, was the median score as high as the third level, the median for New Jersey being at the fourth level and that for New York between the third and fourth.

As in the provision for boys' dressing rooms, the range between the first and third quartiles was less in Massachusetts than in the other three states. No one factor seemed to predominate in lowering the score. Having a poor location, inadequate light, small number of showers, or the lack of a drying room between the showers and locker rooms, either singly or in combinations of two or more, prevented any one of the buildings being placed at the first level and put twenty-six of them in the fifth.

BOYS' SHOWER ROOMS

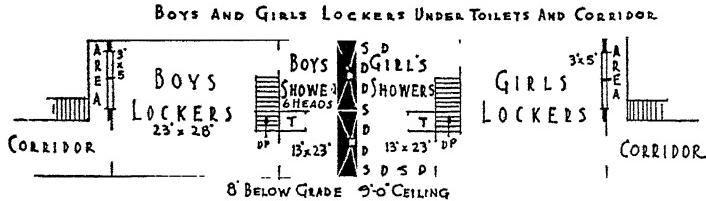
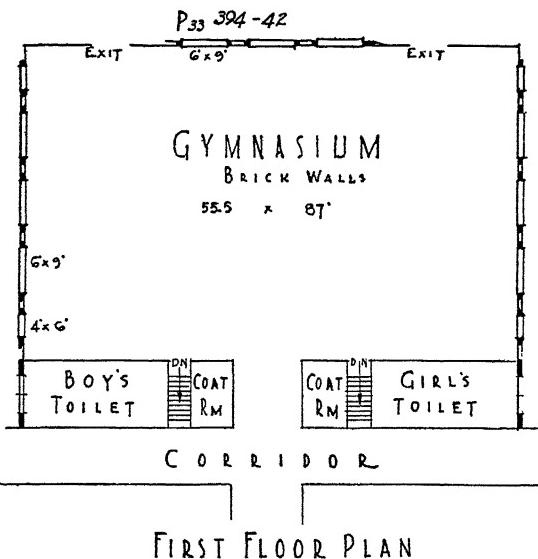


Level b

Level b, New York 25. Cost \$435,000. Enrollment 750. Size of largest physical education class, 36.

Twelve showers for a class of 36, eighteen per cent window area, over fifteen square feet for each shower head gave this shower room its high rating. The lack of a drying room between the locker room and shower room removed it from the a level. Most of the items are at the c level. The location and light for the gymnasium, eleven per cent window area, and but six showers for the girls were the items at the d and e levels. The approximate score for the building is 430.

BOYS' SHOWER ROOMS



Level c

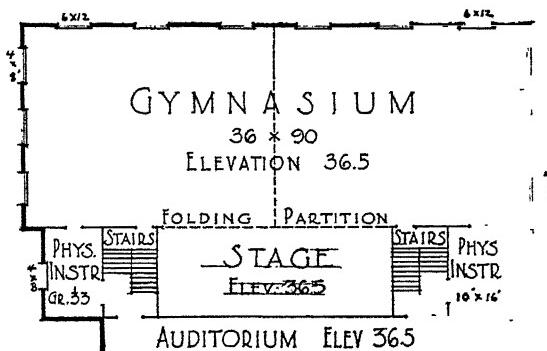
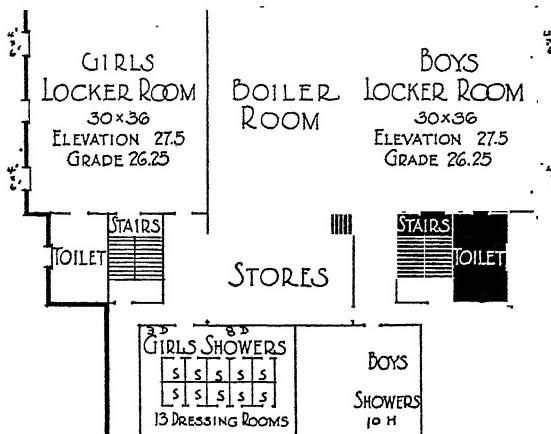
Level c, Pennsylvania 33. Cost \$143,000. Enrollment 394. Size of largest physical education class, 42.

Its location under the gymnasium with eight of the nine feet from floor to ceiling below grade level and less than five per cent window area for the locker room and none at all for the shower room placed the rating between the level c and level d.

The number and size of the gymnasium were the only items given a or b rating. The four showers for the girls and the single toilet fixtures in the shower rooms with none in the locker rooms put these items at the e level. The approximate score for the building is 350.

BOYS' SHOWER ROOMS

Ms 700-41

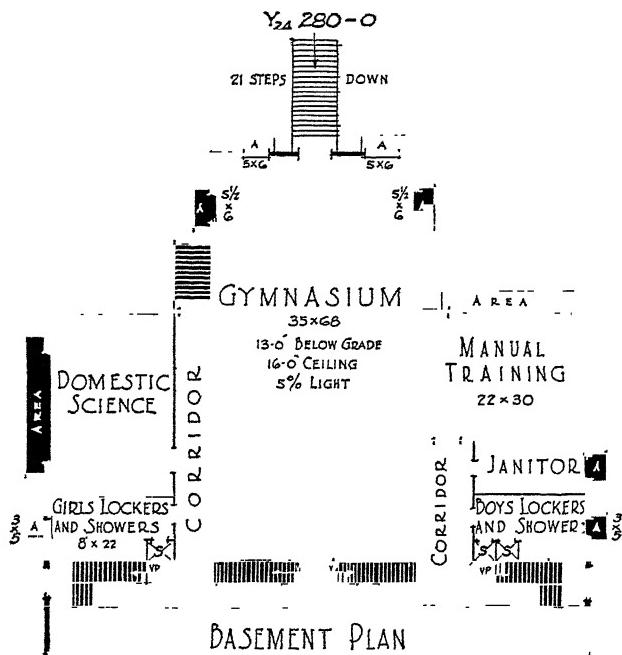


Level d

Level d, Massachusetts 5. Cost \$586,000. Enrollment 700. Size of largest physical education class, 41.

This was one of the few plans where the shower rooms were separated from the locker rooms. Only the sanitary features in this building received a rating as high as level b. The location of the gymnasium, its size and lighting, no provision for storage on the gymnasium level, the shower rooms for girls as well as for the boys were rated on either the d or e levels. The facilities scored 385.

BOYS' SHOWER ROOMS



Level e

Level e, New York 24. Cost \$145,000. Enrollment 280.

This building, scoring approximately 175, received the lowest rating of the 107 included in the study. A gymnasium five feet less than the minimum width of 40 feet, thirteen of the sixteen feet from floor to ceiling below grade level; four small windows at one end in areaways; locker rooms but eight feet wide with a single shower for girls and two for boys, and no sanitary facilities are some of the reasons for the low score. The principal of the building in explaining why they had no organized physical education classes added that they could not use the showers because the drains were too small to carry away the water.

TABLE XVI
SERVICE FACILITIES
Shower Rooms—Boys' Activities

Level a, score 50; Level b, score 40; Level c, score 25; Level d, score 15;
Level e, score 5.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
I	20	20	20	15
2	40	5	35	40
3	20	25	5	40
4	25	20	20	35
5	15	5	25	25
6	25	35	25	15
7	20	45	5	30
8	30	5	10	5
9	20	25	5	15
10	25	15	20	10
11	20	5	40	30
12	35	25	10	30
13	35	25	5	30
14	25	5	5	5
15	20	30	35	40
16	20	5	45	25
17	25	40	15	25
18	30	5	5	5
19		25	25	40
20		5	5	30
21		40		30
22		20		25
23		10		20
24		5		40
25		20		25
26		45		15
27		45		5
28		5		40
29		5		20
30		30		25
31		15		5
32		5		25
33		5		25
34		40		5
35				40

BLDG. NO.	MASS.	N. Y.	N. J.	PENN.
Range	15—40	5—45	5—45	5—40
1st Quartile	20	5	5	15
Median	25	20	15	25
3rd Quartile	30	30	25	30
Q	5	12.5	10	7.5

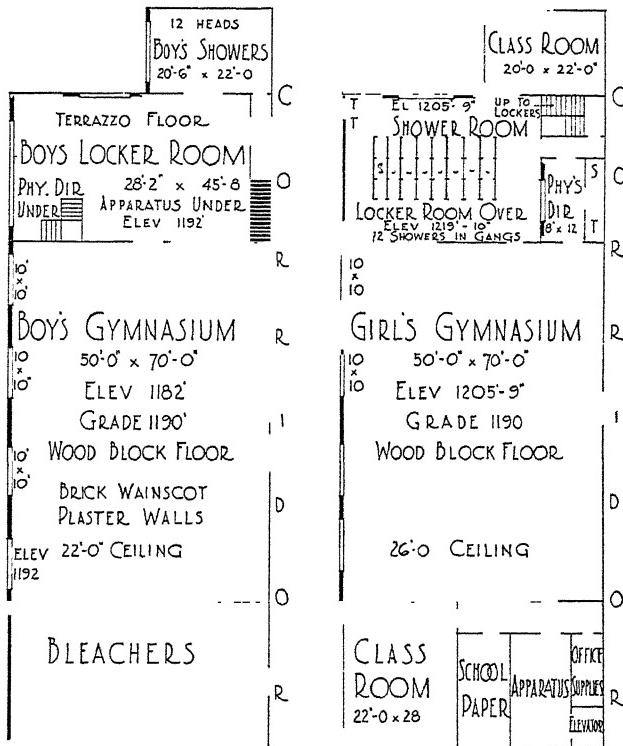
Girls' Activities

The different levels for girls' showers as described in the score card indicate a few of the differences of opinions among leaders in the physical education field, regarding the number and kind of showers that should be installed for the girls. For several who helped in evaluating the different items, the cost for the larger shower room area, for the many dressing booths and individual shower heads as well as the greatly increased cost of heating the water that would be needed outweighed the advantages that level a might have over level c. Some put level c first and level a third, while others saw little to choose between the first three levels.

Table XVIII on page 121 shows that with the exception of one building in Massachusetts and two in Pennsylvania the facilities provided for the girls' showers received a rating lower than either level a, b or c. It so happens that these three buildings were planned by the same firm of architects. In scores given, the Massachusetts buildings were markedly higher than in the other three states and also more even. Only three buildings in Massachusetts scored as low as level e compared with twenty-seven in New York, thirteen in New Jersey, and twenty-three in Pennsylvania that were at level e or below. In these three states the median was at the lowest level and in New York and Pennsylvania the upper quartile was between the fourth and fifth level. In almost all cases the low score was due to too few showers in proportion to the size of the class. Table XVII (page 121) shows how the number of showers installed for the girls compares with the number in the same building for the boys.

GIRLS' SHOWER ROOMS

P.A. 22-48-55



BASEMENT PLAN

FIRST FLOOR PLAN

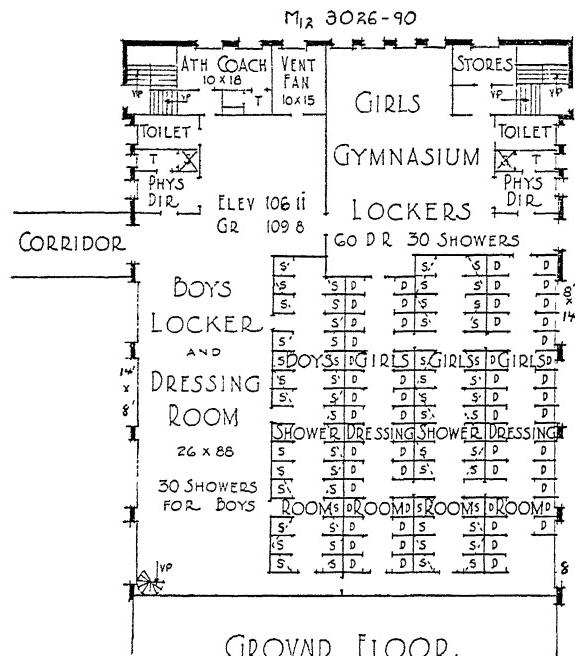
Level b

Level b, Massachusetts 12. Cost \$1,225,000. Enrollment 3,025. Size of largest physical education class, 90.

This building has the largest number of showers, 30, of any included in this study and the gymnasium above (not shown) has the largest ratio between window area and floor space, 30 per cent. The score for the facilities as a whole is approximately 575.

At level a or b are the offices for the directors; the location, size, light, walls, floor, bleacher space and storage for the gymnasium; the locker rooms and sanitary facilities. The only rating at the d or e level was because only one gymnasium is provided for such a large school enrollment.

GIRLS' SHOWER ROOMS

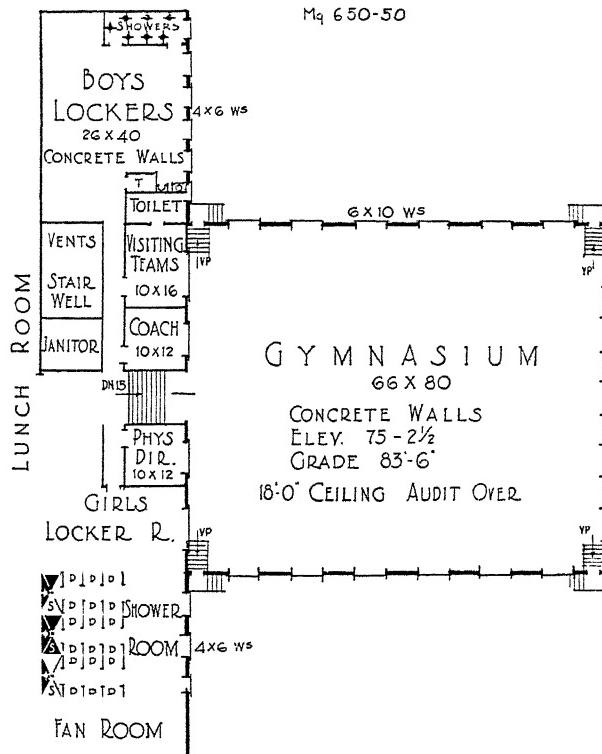


Level b

Level b, Pennsylvania 2. Cost \$800,000. Enrollment 2,242. Size of largest physical education class, 55.

This building, by the same architect as Massachusetts 12, has an entirely different arrangement of showers. Eight showers are so placed that each has two dressing rooms and twelve are placed along the wall without dressing rooms or partitions between the showers. The total score for the physical education facilities is approximately 480. The offices, storage facilities, dressing and shower rooms are at level b. The window area of the gymnasium is but eleven per cent of the floor area in contrast to 30 per cent that this architect provided in Massachusetts 12.

GIRLS' SHOWER ROOMS



Level d

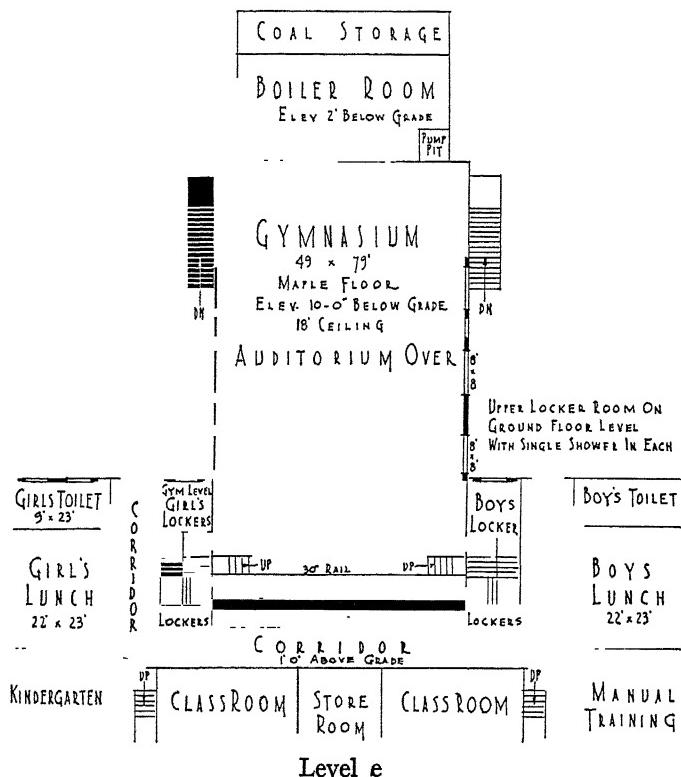
Level d, Massachusetts 9. Cost \$350,000. Enrollment 650. Size of largest physical education class, 50.

The low score for this shower room is largely due to the small amount of window area, five per cent, and the small number of showers, six, for a class of 50.

The score for the total facilities is approximately 400. Most of the items come at the c level. The location of the gymnasium with its concrete walls and the inadequate shower rooms for both boys and girls are the poorest features.

GIRLS' SHOWER ROOMS

Jg 60-30



Level e, New Jersey 9. Cost \$212,000. Enrollment 90. Size of largest physical education class, 30.

This building, scoring approximately 235, received a lower rating than any other New Jersey building. The single shower for boys as well as but one for girls, the gymnasium floor ten feet below grade level, the small window area of the gymnasium, the divided locker facilities on two floors with each little more than a stair landing, the lack of storage space, toilet facilities, or departmental offices are what give the building such a low score.

TABLE XVII

	MASS.	N.Y.	N.J.	PENN.
More showers for boys than for girls	5	27	7	22
More showers for girls than for boys	7	2	2	7
Same number for girls as for boys	6	11	10	6
Total	18	34	19	35

A boys' high school in New Jersey was not included in the "more showers for boys" tabulation.

TABLE XVIII

SERVICE FACILITIES

Shower Rooms—Girls' Activities

Level a, score 50; Level b, score 40; Level c, score 40; Level d, score 20;
Level e, score 10.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	25	10	10	10
2	35	10	35	40
3	15	10	5	40
4	20	10	—	10
5	20	10	20	10
6	25	15	15	5
7	25	35	5	20
8	30	10	5	5
9	10	10	5	10
10	20	10	15	5
11	25	5	25	10
12	40	10	5	15
13	25	10	20	15
14	10	10	5	5
15	10	10	10	10
16	35	5	30	10
17	25	10	10	20
18	20	5	5	0
19		25	10	10
20		5	5	20
21		25		10
22		10		10
23		5		10
24		5		30
25		15		20

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
26		20		10
27		5		5
28		5		30
29		5		10
30		10		20
31		10		5
32		5		10
33		5		10
34		30		5
35				30
Range	10—40	5—35	5—35	0—40
1st Quartile	20	5	5	10
Median	25	10	10	10
3rd Quartile	25	15	20	15
Q	2.5	5	7.5	2.5

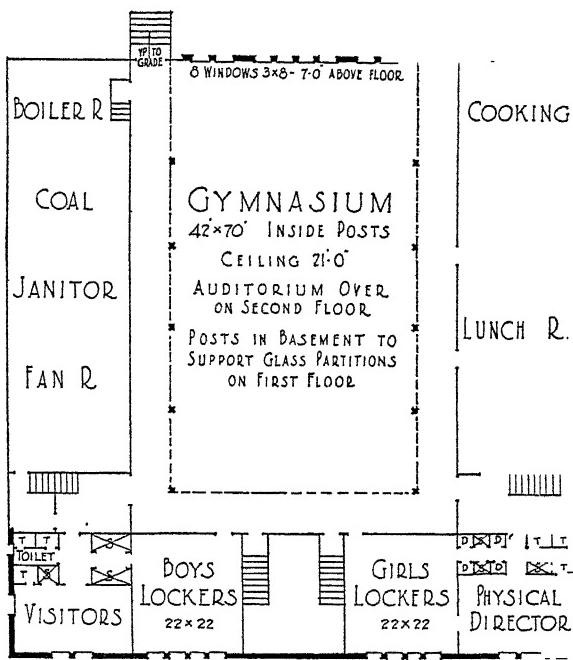
TEAM ROOM

Over a third of the Pennsylvania buildings (eleven out of thirty-five), one-fourth of those in New York (nine out of thirty-four), one-sixth of the buildings in Massachusetts (three out of eighteen) and but one out of twenty in New Jersey had team rooms. These ranged from an alcove opening from the boys' locker room to rooms for both boys' and girls' teams, greater in area, better in location, and equipped with more showers than were provided for the remainder of the school enrollment.

The illustrations on pages 123 to 126, Team Room, in particular, also on page 89, Light for Gymnasium, Building P₂₅; on page 96, P₃₂; on page 101, Apparatus, Y₂₅ and Y₂₂; page 105, Boys' Dressing Rooms, P₁₇; page 111, Boys' Showers, Y₂₆; page 119, Girls' Shower, M₉; page 130, Sanitary Facilities, P₃₅; show half of the team rooms that were planned for these 107 buildings.

TEAM ROOM

Yn 300-36

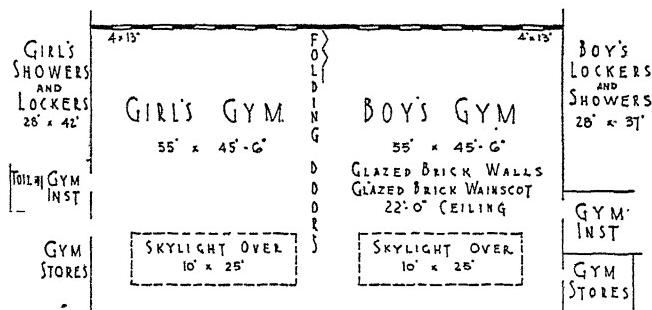


Level b

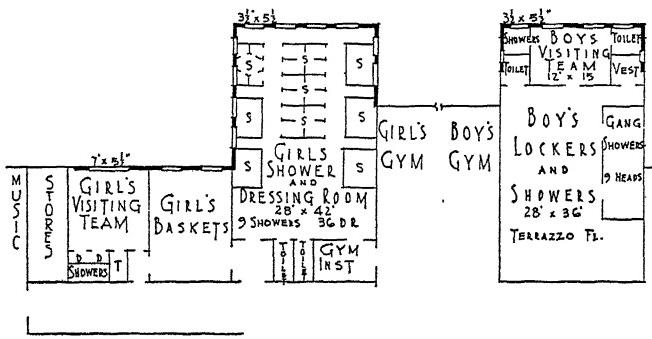
Level b, New York 10. Cost \$165,000. Enrollment 300. Size of largest physical education class, 36.

This building received its highest score because it had a gymnasium which was above the minimum for length, width and height. It was placed at the second level in respect to the team room and sanitary features and at the lowest level for location, light and post boundaries of the gymnasium and shower room facilities for girls. As a whole the facilities scored approximately 370 points.

TEAM ROOM

P₂ 1300-65

FIRST FLOOR PLAN

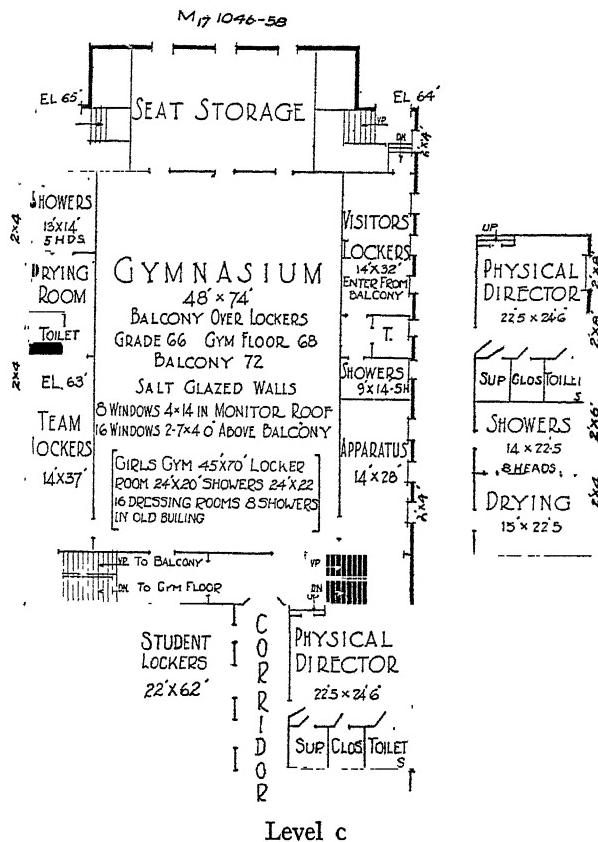


Level b

Level b, Pennsylvania 21. Cost \$900,000. Enrollment 1,300. Size of largest physical education class, 65.

The features of this building that were scored as being at the first or second level were the size and height of the gymnasium, its walls, bleacher space and storage for apparatus. The service facilities with the exception of the girls' showers were at the second level. The poorest features are the location and lighting of the gymnasium and the small number of showers for girls. The approximate score is 475.

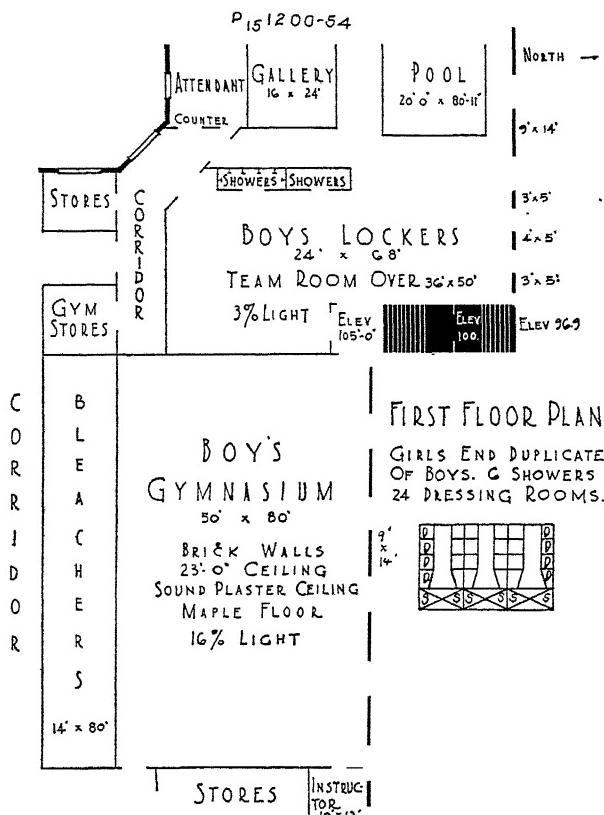
TEAM ROOM



Level c, Pennsylvania 15. Cost \$1,085,000. Enrollment 1,200. Size of largest physical education class, 54.

The low rating for the team room in this building is caused not because the team was inadequately cared for but because too much importance was given to the team. No facility was scored as being at the first level but the gymnasium was placed at the second level for number, size, height and provision for storage. At the second level were the dressing rooms for both boys and girls and the boys' shower room. The girls' shower room was the only item placed at the lowest level. The approximate score was 485.

TEAM ROOM



Level c

Level c, Massachusetts 17. Cost \$750,000. Enrollment 1,000. Size of largest physical education class, 50.

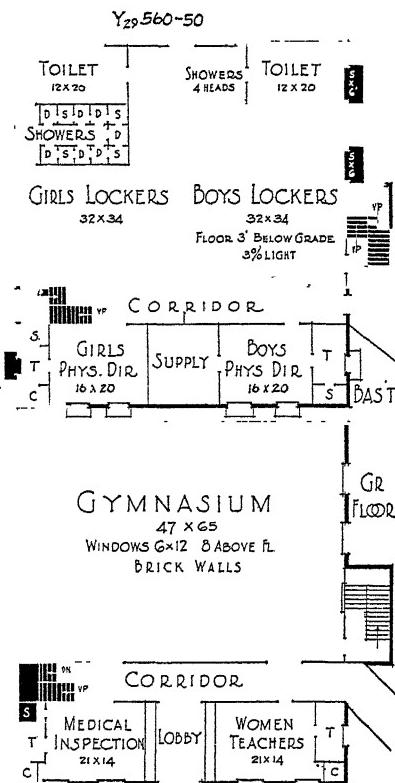
As in Pennsylvania 15, provision for the team seemed to be over emphasized in planning the service facilities. Eight showers for the school and ten for the team, equally divided between the team and visitors, large, conveniently located locker rooms for the team; the entire separation of the teams from the school and from each other all go to show how important were the interests of the team as compared to the physical education program for the entire school.

The features regarded as being on the first or second levels were the director's office; the location, walls and storage facilities for the gymnasium. The approximate score was 335.

SANITARY FEATURES

In the Massachusetts buildings five scored at, or above, the second level and four were given a zero rating. In New York one was at the highest level, fifteen at, or above, the second level and two received zero. New Jersey had five at the highest level, but one at the second and five with zero. Pennsylvania had one at the first level, ten at the second and seven with zero. All four states show a wide range in scores as well as a greater range between the first and third quartiles than for the other service facilities planned for these buildings. The median score was between the second and third level in New York, at the third level in Massachusetts, below the third in Pennsylvania and slightly above the fourth in New Jersey. Table XIX on page 132 shows the score given to each of these buildings.

SANITARY FEATURES

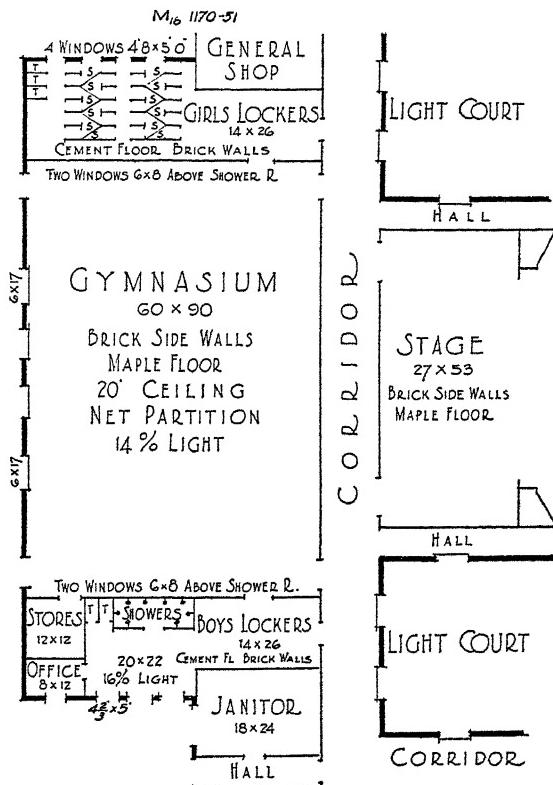


Level a

Level a, New York 29. Cost \$336,000. Enrollment 560. Size of largest physical education class, 50.

Entrance to the toilet room from both the locker room and the shower room is considered a desirable administrative feature. It was however quite generally overlooked in planning the sanitary arrangements in this group of buildings. No other item in this building was placed at level a. The shower rooms for both boys and girls are at the e level. The location of the rooms for medical inspection and women teachers adjoining the physical education department provides examination rooms. The approximate score for the total facilities is 410.

SANITARY FEATURES



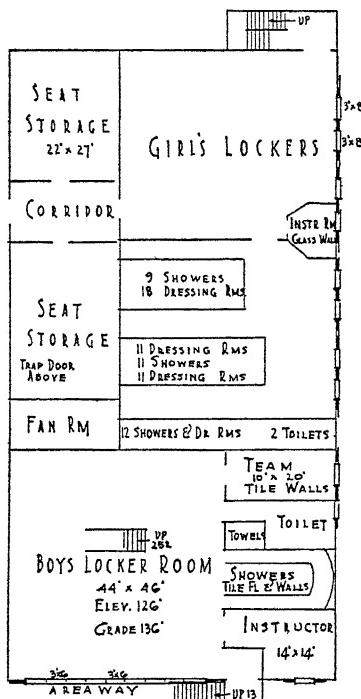
Level b

Level b, Massachusetts 16. Cost \$416,000. Enrollment 1,170. Size of largest physical education class, 51.

The size and height of the gymnasium and space for portable bleachers are the only items except the provision for sanitary features that are as high as level b.

The inadequate provision for departmental offices, only one gymnasium for over 1,100 pupils, with few windows, the small dressing room for girls and poorly located shower room for boys are at the d or e level. The approximate score for the total facilities in this building is 370.

SANITARY FEATURES

P₃₅ 1800-70

Level c

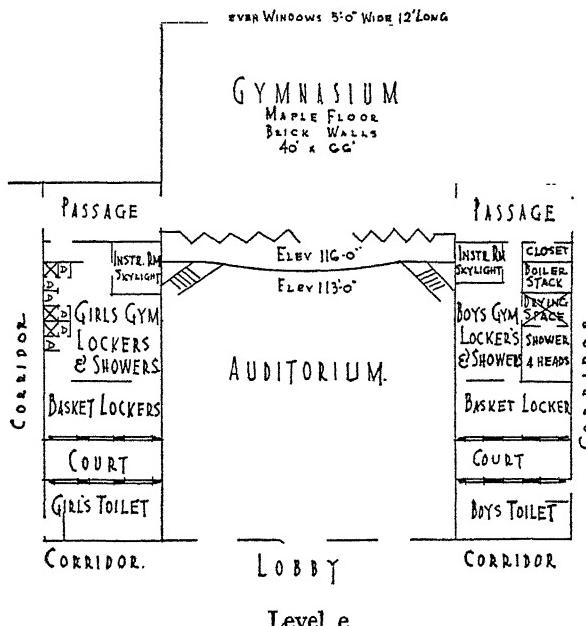
Level c, Pennsylvania 35. Cost \$950,000. Enrollment 1,800. Size of largest physical education class, 70.

The gymnasium of this building was used as an illustration for level b bleachers. This illustration of the floor below the gymnasium shows the amount of space given to seat storage. There are 26 showers for girls with 52 dressing rooms and 20 showers for boys.

Most of the items receive the c rating, the approximate score is 485.

SANITARY FEATURES

JRC 530-75



Level e, New Jersey 20. Cost \$250,000. Enrollment 530. Size of largest physical education class, 75.

The only feature of this building that was given the level b rating was having a gymnasium for an enrollment of 530. The d, e and zero ratings were many. The location, size and light for the gymnasium, the dressing and shower rooms for both boys and girls; the lack of sanitary features in the locker rooms or storage space for the gymnasium all helped to lower the approximate score of 270. The illustration shows clearly the distance from the locker rooms to the building toilet rooms.

TABLE XIX

SERVICE FACILITIES

Sanitary Features

Level a, score 50; Level b, score 40; Level c, score 30; Level d, score 10;
Level e, score 5.

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	45	5	0	25
2	45	35	40	30
3	45	45	0	50
4	0	10	25	30
5	40	10	10	35
6	5	45	50	10
7	0	30	10	40
8	30	35	5	40
9	15	40	0	0
10	35	40	50	35
11	0	35	50	35
12	35	40	10	40
13	45	40	30	10
14	10	10	10	35
15	10	10	50	0
16	35	10	50	40
17	0	40	0	40
18	10	5	15	0
19		0	30	30
20		35	0	40
21		25		40
22		40		0
23		40		10
24		0		0
25		10		0
26		40		40
27		40		10
28		40		40
29		50		5
30		40		0
31		40		5
32		10		40
33		10		10
34		40		10
35				25

BLDG. NO.	MASS.	N. Y.	N. J.	PENN.
Range	0—45	0—50	0—50	0—50
1st Quartile	5	10	0	5
Median	30	35	15	25
3rd Quartile	40	40	50	40
Q	17.5	15	25	17.5

TOWEL AND SUIT FACILITIES

All but eight of the buildings in Massachusetts, seven in New York, seven in Pennsylvania and three in New Jersey were given a rating of zero on this item. M₂, illustrated on page 78, Location of the Gymnasium and P₃₅, illustrated on page 130, Sanitary Facilities, were both placed on the first level.

M₁₁, illustrated on page 88, Light, and P₁₅, illustrated on page 126, Team Room, were on the second level. M₅, illustrated on page 113, Boys' Showers, was on the third.

DRYING CLOTHING

In one New Jersey building two rooms, each 10 by 14 in connection with the offices of the directors, were labeled suit rooms. Two New York buildings had storage rooms of adequate size in connection with both the boys' and girls' locker rooms. One hundred of the 107 buildings were given a zero score on this item.

SUMMARY

Table XX on page 134 gives the total score for each of the buildings included in this study. Each score is the average of the several ratings to the nearest multiple of five. Table XXI on page 135 gives the frequency distribution of these scores by states and for the entire group of buildings. This table also shows the quartiles, medians, averages and standard deviation of each average.

It will be noted how slight are the differences in both variability and central tendency between the buildings of the different states. New York, with two buildings scoring lower than any building in the other three states and two scoring higher than any in the other states, has a greater range and so a larger standard deviation. In no case is the difference between the averages of the different states highly sig-

nificant. The difference between the average for Massachusetts (415) and that for New York (400) is only about one half the standard deviation of that difference. The greatest difference, that between the average for Massachusetts and the average for Pennsylvania, is a little over twice the standard deviation of that difference.

TABLE XX
PHYSICAL EDUCATION FACILITIES
Total Scores

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
1	365	360	410	340
2	585	360	435	470
3	425	460	235	530
4	365	255	335	430
5	385	290	430	350
6	415	490	445	260
7	440	570	350	405
8	285	345	310	380
9	405	400	235	240
10	425	370	580	290
11	395	340	490	345
12	575	345	315	330
13	575	405	425	310
14	400	355	330	305
15	260	610	535	485
16	370	220	510	320
17	445	470	405	485
18	325	390	350	265
19		365	400	365
20		335	275	470
21		380		475
22		435		360
23		330		370
24		175		355
25		465		355
26		430		345
27		545		230
28		330		560
29		415		225
30		420		340
31		470		225

BLDG. NO.	MASS.	N.Y.	N.J.	PENN.
32		385		380
33		310		350
34		760		375
35				485

TABLE XXI
PHYSICAL EDUCATION FACILITIES
Frequency Distribution of Scores

SCORES	MASS.	N.Y.	N.J.	PENN.	ALL
175—199	0	1	0	0	1
200—224	0	1	0	0	1
225—249	0	0	2	4	6
250—274	1	1	0	2	4
275—299	1	1	1	1	4
300—324	0	1	2	3	6
325—349	1	6	2	5	14
350—374	3	5	2	7	17
375—399	2	3	0	3	8
400—424	3	4	4	1	12
425—449	4	2	3	1	10
450—474	0	4	0	2	6
475—499	0	1	1	4	6
500—524	0	0	1	0	1
525—549	0	1	1	1	3
550—574	0	1	0	1	2
575—599	3	0	1	0	4
600—624	0	1	0	0	1
625—649	0	0	0	0	0
650—674	0	0	0	0	0
675—699	0	0	0	0	0
700—724	0	0	0	0	0
725—749	0	0	0	0	0
750—774	0	1	0	0	1
Total	18	34	20	35	107
1st Quartile	365	345	315	310	330
Median	400	385	400	350	375
Average	415	400	395	366	392
3rd Quartile	440	450	445	430	445
S.D. of Dis.	90	108	92	86	97
S.D. of Av.	21.2	18.6	20.6	14.6	9.4

Only twelve of the 107 buildings were scored above 500 and but two, both in New York, above 600. One reason why the total score for a building was low was because certain facilities were missing. Only two buildings had examination rooms which reduced the score by 50 for the 105 buildings without them. Only three showed a corrective gymnasium. This meant a deduction of 125 points from the score of 104 buildings. Special rooms for drying athletic clothing (20 points) were in but seven buildings, towel and suit facilities (20 points) were in twenty-five buildings, team rooms (25 points) in twenty-four and the twenty-five buildings with no provision for bleachers had the score reduced by 40 points for the lack of this feature.

A building at the highest level in other respects but without examination rooms, a corrective gymnasium, bleachers, team rooms, towel, suit and drying rooms would have its score reduced 290 points for the lack of these facilities. Since some directors of physical education would characterize the first four items as a waste of money and would recommend that they be omitted, the total score for the building is not so significant as the levels reached by the facilities that were provided.

Table XXII on page 138 gives the levels reached by the first, middle and third quartiles for the facilities found in most of the buildings. Since each building had a gymnasium and there were more small enrollments than large ones, the score for number of gymnasiums reached higher levels than did any other facility. The girls' shower room received the lowest rating of any facility provided. In no one of the four states did the upper fourth of the scores for the girls' shower room reach as high as the c level and in two states three-fourth of the scores were below the d level.

Somewhat higher are departmental offices, location of the gymnasium, light for the gymnasium, bleachers, apparatus and storage, boys' shower rooms and sanitary features. In all of these the median score falls below the middle level. The median score for the lighting of the gymnasium is but slightly above the median for the girls' showers.

For several items (dressing rooms, size and height of the gymnasium, departmental offices and location of the gymnasium)

there was a tendency for the upper quartile to be at the second level, the median at the third level and the lower quartile at the fourth level. It almost seemed as though it was a matter of chance whether the worth of the facility provided was good, fair, or poor for promoting a desirable physical education program. This seeming chance relationship is best illustrated in regard to the lighting of the gymnasium because here the value is expressed in the generally accepted term of percentage that the window area is of the floor area.

It should be remembered that these 107 buildings are all high schools that were approved by the state departments in which they were built and each was checked for light of classrooms as well as for exits and ventilation. That this emphasis upon light for classrooms did not carry over into emphasis upon light in the gymnasium is seen in Table XXIII.

The accompanying diagram on page 140 shows how closely the smoothed curve showing the number of buildings at each percentage of window area level approaches the probability curve, or curve of chance, constructed on the same average as the frequency distribution with the same standard deviation.

The table is read as follows: For the Departmental Offices in the Massachusetts buildings the first quartile came halfway between the third and fourth levels, the median building was at the third level and in the upper fourth of the buildings the offices were at the second level or higher. The symbol c—d was used when the quartile came halfway between the two. The + and — symbols indicate five points above or five below the level indicated by the letter.

TABLE XXII
DISTRIBUTION OF SCORES
FOR
PHYSICAL EDUCATION FACILITIES
107 Buildings

		Mass.	N. Y.	N. J.	Penn.
First Quartile	Level	c—d	c—d	c—d	zero
Median	Level	c	c—d	c—d	c—d
Third Quartile	Level	b	b	b	c
	Number of Gymnasiums				
First Quartile	Level	d	c	c	d
Median	Level	c	b	b—c	b—c
Third Quartile	Level	b	a—	b	a—
	Location of Gymnasium				
First Quartile	Level	d	d	d	d—e
Median	Level	c—d	c—d	c	d
Third Quartile	Level	b	b—c	b	c
	Size and Height of Gymnasium				
First Quartile	Level	d+	d+	d+	d
Median	Level	c+	c—	c	c
Third Quartile	Level	b	b—	c+	b
	Light for Gymnasium				
First Quartile	Level	e	d—e	d—e	e
Median	Level	d	d—e	d—e	e
Third Quartile	Level	c	b	b	d
	Bleachers for Gymnasium				
First Quartile	Level	c—d	d—e	c—d	e
Median	Level	c—d	c—d	c—d	c—d
Third Quartile	Level	b	b—c	c	c
	Apparatus and Storage				
First Quartile	Level	e	zero	e	zero
Median	Level	d	d—e	d	d
Third Quartile	Level	b	b	b—	c—
	Service Facilities				
	Dressing Rooms				
First Quartile	Level	d+	d	d	d
Median	Level	c	c—	c—	c—
Third Quartile	Level	c	b—c	b—c	b—c
	Shower Rooms—Boys				
First Quartile	Level	c—d	e	e	d
Median	Level	c	c—d	d	c
Third Quartile	Level	c+	c+	c	c+
	Shower Rooms—Girls				
First Quartile	Level	d	e—	e—	e
Median	Level	d+	e	e	e
Third Quartile	Level	d+	d—e	d	d—e
	Sanitary Features				
First Quartile	Level	e	d	zero	e
Median	Level	c	b—c	d+	c—
Third Quartile	Level	b	b	a	b

TABLE XXIII
LIGHT FOR THE GYMNASIUM

PER CENT WINDOW AREA IS TO FLOOR AREA	NUMBER OF BUILDINGS
0—1	3
2—3	2
4—5	6
6—7	5
8—9	10
10—11	12
12—13	7
14—15	17
16—17	15
18—19	4
20—21	17
22—23	1
24—25	7
26—27	0
28—29	0
30—31	1
<hr/>	
	107
	Average 14.57
	S.D. 6.2

Three buildings located under the auditorium had practically no outside light. One building, in a separate wing with large windows on the two sides, had a window area over 30% of the floor area.

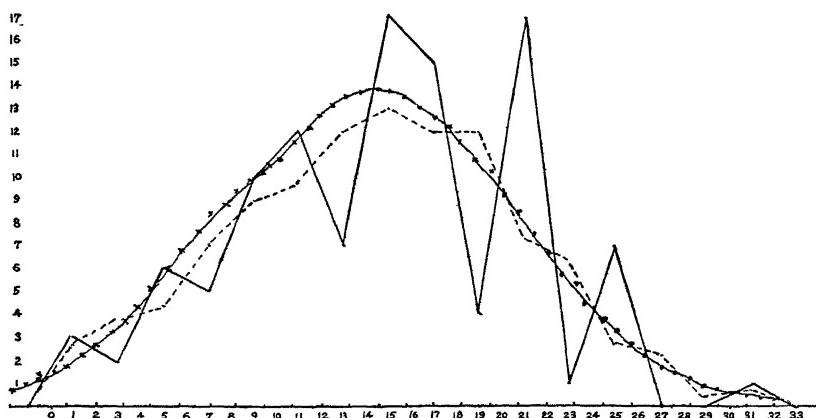


Diagram to illustrate the resemblance between the frequency polygon for the data in Table XXIII regarding the percentage of window area for the gymnasium and the normal curve of error. The saw tooth line shows the number of buildings at each step level. The broken line is the first line "smoothed" by taking each step as "the arithmetic means of its value and the two adjacent values."¹ The line with dots is the normal curve using the average and standard deviation of Table XXIII.

¹ Rugg, Harold O. *Statistical Methods Applied to Education*, Houghton Mifflin Co. 1917, p. 186.

Chapter IV

POSSIBLE REASONS FOR DIFFERENCES IN PROVISIONS FOR THE PHYSICAL EDUCATION PROGRAM

THE question naturally arises: Why do these new buildings show such marked divergence from the standards generally accepted by those who have had much to do with the planning of school buildings and from the recommendations of those who have specialized in physical education? Either the architects who planned the buildings and the committees responsible for their erection have been unfamiliar with these standards and recommendations or they have chosen to ignore them as not being adapted to conditions in the local community or have considered their own ideas to be superior. While this study has not been carried far enough to answer this question certain factors will need to be considered in attempting to find a method that will secure better facilities in future buildings.

MANY DIFFERENT ARCHITECTS

The one hundred seven buildings represent the work of seventy-three firms of architects. One Massachusetts firm had three of the eighteen Massachusetts buildings and two of the thirty-five in Pennsylvania. A New York firm had six of the thirty-four schools that were studied in that state. One New Jersey firm had two of the New York buildings and four of the twenty New Jersey buildings. Another New Jersey firm had two in New York and two in New Jersey. One Pennsylvania firm had three of the buildings studied in that state. Fourteen firms had two buildings during this two year period, while fifty-five different firms had but one. In all, seventy-three different firms were employed for these one hundred seven buildings.

A study of the different buildings planned by any one firm of

architects does not seem to support the theory that variations in planning are caused by attempts to meet local conditions. The five buildings planned by the Massachusetts architect more nearly met the standards used in this study than did those coming from any other firm. In no case was the gymnasium placed under the auditorium, or made to serve as its stage. No space was used for permanent bleachers; the locker rooms in four of the five buildings provided more than the standard amount of space; and the number of showers, although less than the standard recommended, was nearly twice the median number found in the one hundred seven buildings included in this study. Anyone familiar with one of these buildings would at once recognize any one of the others as having been planned by the same architect.

The six buildings planned by the one firm for New York state also had marked family resemblances. Much space was used for permanent bleachers (in three it was equal in area to the gymnasium floor); the gymnasium was under the auditorium in three cases and a stage for the auditorium in a fourth; and the locker and shower rooms were located across corridors, or under the gymnasium.

The New Jersey firm, that had six of these one hundred seven buildings, planned them all along similar lines whether the building cost less than \$150,000 or five times that amount. The gymnasium was always in a separate wing, above grade level, and amply lighted. In only one case was the space devoted to bleachers over forty per cent of the space given to the playing floor and that building was the only one of the six in which the space allotted for lockers was below the standard. In all of the others the locker space far exceeded the minimum. All six of these buildings were deficient in the number of showers. In three, more showers were installed for the boys than for the girls, in two the number was the same and in one the girls had one additional shower over the number given the boys.

The four buildings planned by the other New Jersey firm, referred to above, were also very similar to each other. Two were stages to the auditorium, all locker rooms were well lighted and generous in space, and the number of showers very limited, especially for the girls.

If the several buildings planned by any one firm of architects with

so great a range in size and cost were so similar to each other, both where they agreed with the standards and also where they departed from them, it seems hardly reasonable to suppose that it was local requirements which caused the architects who planned but a single building to vary so greatly in the provisions made for physical education.

LOCAL ARCHITECTS PREFERRED

With a few conspicuous exceptions the architect chosen to plan one of these buildings either resided in the community where the building was erected, or in a near-by city. Dr. John A. H. Keith, then Superintendent of Public Instruction in Pennsylvania, in giving the writer authority to examine the schoolhouse plans on file in the department, said, "We are running a school all the time for architects who are trying to plan school buildings and most of the pupils are in the kindergarten class so far as their knowledge of school needs is concerned."

VARIETY IN PHYSICAL EDUCATION PROGRAMS

The variation in the facilities provided for the physical education program might be due to the variations in programs that were planned to be carried out in these buildings. It seems as though there might be more to this argument than to the one that the buildings had been adapted to the needs of the local community.

Staley¹ states that during the past sixty years in the order of their appearance the physical program has been (1) the cultivation of a beautiful, harmoniously developed body, (2) the training or conditioning of the physique, and (3) that the work should be directed toward making contribution to the general education of the individual.

Schutte² reviewed the rather extensive literature concerning objectives in physical education and concluded that "the newer empha-

¹ Staley, Edward C. *The Program in Physical Education for the High School*. Unpublished Doctor's Thesis, Graduate School, University of Illinois. 1929.

² Schutte, Fred K. *Objectives of Physical Education in the United States. 1870-1929*. Unpublished Master's Thesis. School of Education, New York University, 1930.

sis gives opportunity to the individual to participate in those activities which give him the greatest satisfaction. Encouragement is given to the individual to participate in programs which present opportunities for creative experience."

Practice is still behind educational theory if one may use as a basis for judging the physical education programs that were being carried on in the forty cities visited by the writer (see pages 171 and 172). In very few of the cities was there a program in the sense that we have one in an academic subject in which a student starts at a certain place, covers a fixed portion of work in a fixed amount of time and his degree of accomplishment is used as a basis for planning his future work in that subject.

In one city in New York the medical examination, the physical fitness index, the pupil's out of school activities, and the opinion of the director were combined in working out for each high school student an individual program. This, for some, meant that they were excused entirely from the work carried on by the department. For others, it meant a period each day using exercises especially prescribed to correct some recognized physical defect. Each boy and each girl who was not excused knew definitely the reason and in the individual conference with the director agreed upon the need for the assigned program. In contrast to this in another of the cities in New York, selected by the state director as outstanding, assignment to the gymnasium was made on a basis of having a vacant period; preparation meant changing street shoes to sneakers and the chief activity according to the city director was throwing a ball around the room.

In one high school in Massachusetts the instructor said very frankly that the entire work in the gymnasium was preparing for the May pageant. In a Pennsylvania city the director said his objective was securing \$10,000 each year to apply on the debt for the stadium.

A New Jersey director when asked for a copy of his physical education program said they had calisthenics on Monday, apparatus work on Wednesday and swimming on Friday and there was no need for anything additional by way of a program.

Only six of the forty directors in the cities visited had any record of what had been done from day to day in the physical education period during the previous year. Most of them said there was so

little variation in the daily programs that there was no need to make out lesson plans, or keep a record of work done.

In each of the forty cities visited the directors for the boys' and for the girls' activities were asked to write out what could be taken as a typical gymnasium program. Outside of New York state it was about as follows: three to five minutes marching, fifteen minutes calisthenics (for which apparatus work was frequently substituted in schools having adequate equipment), fifteen minutes for a game, dance, stunts, or tumbling. The shower was usually part of the boys' program even when there were as few showers as one for each eight to ten boys. No place was visited where the shower was required when the equipment was less than one shower for each four girls except where gang showers for girls as well as for boys had been installed. One school visited with twenty-two showers for girls and classes of seventy-five, allowed no time for the shower in the regular program period because of too few showers.

The ten New York state schools showed a far wider variety of practices than were found in the thirty visited in the other three states. The best work seen, as well as the worst, was in this state. In all of the ten schools the pupils were classified by the Rogers Physical Fitness Index and usually assigned to classes on the basis of their rating. In most of the schools the A group was excused and in places where the facilities were inadequate the B group was excused also. One school excused the A, B, C, and half of the D group. Individual exercise cards were found for all non-excused pupils in one city and for the C and D groups in four cities. More than in the other three states combined, the emphasis was placed on determining why a pupil's physical fitness was D or C and how it might be raised. In spite of all this emphasis upon corrective work only two of the thirty-four New York buildings included in this study had a corrective room as part of the provision for the physical education program.

THE INDEFINITENESS OF STATE COURSES OF STUDY REGARDING FACILITIES

The next point of attack was an attempt to discover if the state manuals for physical education might have had an influence in determining the facilities to be provided.

The *Massachusetts Manual*¹ on physical education states that "at least two 60 minute periods each week should be devoted to physical education in addition to the time given to instruction in hygiene." "A 60 minute period may be divided as follows: 7 minutes for change of clothing, 10 minutes for floor work, 13 minutes for bath and dressing and 30 minutes to be devoted to work on apparatus, dancing, athletics, or games."

The *New York Syllabus for Physical Training*,² in use at the time these buildings were planned says that a minimum of 60 minutes a week of actual work on the floor is required. A uniform is urged and the "drills followed by a bath where possible." The Résumé³ for Teachers and Administrators (1929) states "Activity programs must be adjusted to individual physical needs, and physical educators must concentrate on those who most need their services."

Note. The *New York Syllabus* (1934) pp. 34-35 shows present Standards of the School Buildings and Grounds Division.

The New Jersey⁴ course in physical training gives the time allotment as 3/6 of 150 minutes for posture, setting up, formation and marching, gymnastics, games and rhythmic exercises; 1/6 community civics and hygiene; 2/6 gymnasium work, organized sports.

The *New Jersey Standards in Physical Education*⁵ has as the only mention of facilities: "Other things being equal, it can be assumed that the effectiveness of physical education will increase proportionately with improvement in facilities."

In the *Pennsylvania Course of Study in Physical Education* (1925) is found the statement that "the gymnasium, dressing rooms

¹ *Physical Education in the Public Schools*. 1924. A Manual for Teachers in Junior and Senior High Schools.

² *General Plans and Syllabus for Physical Training*, 1917.

³ *Physical Education*. A Résumé for Teachers and Administrators. 1929.

⁴ *Course in Physical Training*, Grades IX to XII. High School Series, No. 7, 1917.

⁵ State of New Jersey, Department of Public Instruction. *Standards in Physical Education*. 1932.

and shower rooms should be well lighted, well ventilated and special attention given to maintain the temperature about 65 degrees. The time required is two periods a week and for hygiene one period. Lessons should be arranged so that all parts of the body receive a certain amount of exercise. The gymnastic lesson should include 2 minutes marching, 5 minutes calisthenics, 13 minutes on apparatus, 10 minutes for a game, folk dance, or athletic stunt."

Nowhere in these manuals for the four states was there anything that could be used by architects or local school committees to determine what was considered essential, or desirable in the way of facilities for the physical education program.

Twenty-six other states were found to have Manuals, Courses of Study, Syllabi, or Bulletins regarding physical education. These show a wide range of opinion. The *Florida Syllabus*¹ says that "the majority of the schools in Florida do not have large gymnasias, elaborately equipped with all types of apparatus, This, however, is not a deplorable situation, on the contrary it is a very wholesome one. It simply means that Florida does not have to throw thousands of dollars worth of dumbbells, ladders and all types of Swedish apparatus into the trash heap as many states are now doing." "Every school should have a minimum of four to six showers for girls and the same for boys. However, the bath is not an absolute essential. In the history of the race it has been infrequent. Workmen are not able to take a bath every time they perspire and while children have seldom been afforded opportunities for showers after play periods no disastrous results have been shown." In a similar strain the Oklahoma Course² of Study states that "much money is being spent in Oklahoma for gymnasiums for a few boys and girls to play a few games of basket ball a few days of the school year. It is far more important that many children have much space in which to play many games with perfect freedom much of the time."

At the other extreme the state law in Ohio says that "all pupils in the elementary and secondary schools of the state shall receive as part of their instruction such physical education as may be prescribed or approved by the Director of Education." Sec. 7721. "It shall be

¹ *State Syllabus, Health and Physical Education, Senior High Schools, 1926.*

² Pearl E. Wilson, R.N., *Oklahoma Course of Study for Health Education, 1927.*

the duty of the boards of education to make provision for the courses in physical education prescribed." Sec. 7721-7. Under "Indoor Facilities" the Program of Junior and Senior High Schools¹ gives seven pages (largely adoptions from the *California Score Card for Evaluation Physical Education Programs*) of specific details regarding the gymnasium, size, height of ceiling, floors, bleachers, apparatus room, corrective room, rest room, instructors' offices, dressing rooms, lockers, drying rooms, shower rooms and fixtures.

No other state, not even California whose score card was so extensively quoted in Ohio, is so specific. The preface to the California Score Card² says that "not having adequate tools to measure pupils' progress in terms of their athletics, the next best procedure seems to be that of measuring the elements of the school's physical education set up and then to assume a close correlation between set up and progress of the student."

Indiana's program³ calls for a "gymnasium on the ground level, accessible to main corridor, locker, showers, toilets and play field. Dimensions of 40 by 60 although 50 by 80 is preferred. Height 20 feet or more. Two are necessary in schools 500 to 800. Windows should be on the two long sides of the gymnasium, glazed brick wainscoting, recessed radiation; ratio window and floor area, gymnasium and auxiliary rooms, 20 to 25 per cent or more. Lockers, showers, and lavatories sufficient in number to take care of participants in minimum time." The Course of Study⁴ in describing special equipment says that "probably the first essential is the provision of shower facilities."

Courses of Study for physical education in the other states describe the facilities in very general terms if they mention them at all. Missouri says that "there should be a gymnasium for each 500 students or fraction thereof. This gymnasium should not be less than 45 feet by 85 feet in the clear with a minimum height of 18 feet." The Maine, Michigan, Rhode Island, Virginia and Washington

¹ D. Oberteuffer, Ph.D., *Health and Physical Education Series*, Vol. III. 1932.

² Bulletin No. E—2. California State Department of Education. *A Score Card for Evaluating Physical Education Programs*.

³ *The Health Education and Physical Education Program for Indiana High Schools*. 1930.

⁴ *Indiana Tentative Course of Study in Health and Physical Education*. Grades VII-88. 1930.

courses indicate that a gymnasium is desirable. The others do not include any reference to facilities.

* STATE SCHOOLHOUSE BUILDING CODES

It was thought that school building codes might well be considered a source of information as to what the state desired in the way of physical educational facilities. In Massachusetts¹ the Department of Public Safety Division of Inspection approves all building plans. The Regulations Relative to the Inspection of Buildings (1931) permit the location of the gymnasium in the basement but confine all specifications to the matter of exits, lights, and ventilation. In New York² the only references to physical education facilities in the 1926 Code were that the "gymnasium doors shall swing outward," that the gymnasium "shall have one or more emergency exits opening directly out of the building," and that "a combination auditorium and gymnasium with single movable partition between is not favored." The *New Jersey Code*³ included the law that "no contract for the erection of any public school building or any part thereof shall be made until and after plans and specifications thereof shall have been submitted to and approved by the State Board of Education." The only reference that has any bearing upon the physical education facilities is where, in defining classroom as "all rooms used by the pupils for classroom purposes," it excludes gymnasium, assembly and manual training rooms from the requirements for classrooms.

The *Pennsylvania Code*⁴ was equally silent regarding specifications for physical education facilities. Schoolhouse plans of districts of the second, third, and fourth class must be "submitted to the State Council of Education and any recommendations concerning the same by the State Council of Education laid before the Board of

¹ The Commonwealth of Massachusetts, *Department of Public Safety Regulations Relative to the Inspection of Buildings*. Form B—1 (1931).

² *Laws, Rules and Information Relative to School Building Construction*. School Building Pamphlet. University of the State of New York. 1926.

³ State of New Jersey, Department of Public Instruction. *Building Code Comprising the Law and the Rules and Regulations of the State Board of Education Concerning Public School Buildings*. Revised July 1, 1925.

⁴ Commonwealth of Pennsylvania, Department of Public Instruction. *Rules and Regulations for Public School Building Construction*. 1931.

School Directors." The design and proposed location of public buildings must be approved by the State Art Commission. Aside from specifying the number, location and size of exits from the gymnasium and indicating that direct access to the gymnasium is desirable with as few steps as possible, the only reference to physical education is to the desirable amount of artificial illumination for gymnasium, shower and locker rooms, and swimming pool.

All references to the physical education facilities in the laws, rules and regulations regarding school buildings in other states were brought together and compared with the code regulations in the four states receiving special consideration in this study. In but five of these were the requirements and recommendations found to be any more definite.

Connecticut's Code, Laws Relating to and Recommendations for Construction of Schoolhouses (A 30), specifies ten per cent light for the gymnasium, permits light from two sides, recommends the location of the gymnasium in an annex and two gymnasiums when there are more than 600 pupils. Size is to be 60 by 80 feet with ceiling height from 18 to 22 feet, and showers on a basis of one for each five boys and one for each three girls.

The *Kentucky Suggestive Rules and Regulations* (1933) give the minimum size of a basket ball court as 35 by 60 feet and the maximum size as 50 by 90 feet clear playing space, and recommend a minimum ceiling height of 18 feet. "The two long sides of the gymnasium should be exposed to permit the sweep of air and sunlight across the floor." "Direct entrances to the auditorium and gymnasium should be available. Ample shower rooms and locker rooms for each sex shall be provided, conveniently located in relation to the gymnasium."

The *Michigan Bulletin on School Buildings, Equipment and Grounds* (1922) states that "the best size for gymnasiums is from 50 to 60 feet wide by 70 to 90 feet long and at least 22 feet in the clear in height. It is a fatal mistake to construct a gymnasium that does not have room for spectators during competitive games. A school needs the support which comes from such exercises." "The gymnasium should be located on the ground floor, it must have separate dressing rooms and shower and locker rooms for boys and girls.

The gymnasium should have ample light—skylights are not desirable. There should be a minimum of six showers for girls with twelve booths. There will need to be one shower for each two girls in the largest class or group that will use the showers at any one time."

The *Minnesota Laws and Rules Governing School Buildings and Sites* (1928) as in the Kentucky regulations give the minimum and maximum size of a basket ball court, and as in Connecticut, specify ten per cent light for rooms other than classrooms. They permit the gymnasium floor to be not more than three feet below grade and make no mention of shower and locker rooms.

The *Missouri Schoolhouse Planning and Construction Bulletin*, No. 2 (1933), states that "the instructions and forms are not mandatory but are suggestive of a proper method of procedure." For the gymnasium detailed "suggestions" are given on location, size, lighting ("1/8 to 1/12 of the floor area"), floor, walls, heating and ventilation, bleacher space ("used only a few times a year. It is a waste of space and money to provide excessive room"), ceiling, dressing rooms, showers ("for girls, 8 to 10 shower heads are needed for a class of 40 pupils"), offices and storage.

The Delaware Code requires that "skeleton plans of each floor shall be submitted to the State Board of Education for their approval before working drawings are started." The Kentucky Rules and Regulations state that "preliminary drawings showing the floor plans and front elevation should be submitted to the Superintendent of Public Instruction for criticism and advice," and the Missouri Bulletin "recommends that no district undertake a building program until a carefully made survey has shown the need for new buildings and the ability of the district to pay for the program. These specifications furnish the architect a basis for his preliminary drawings. The State Director of School Buildings Service should examine these preliminary drawings and should suggest needed changes to meet the needs of this particular school." With these exceptions the codes in the thirty-four states requiring submission of plans seem to be restricted to suggestions, or requirements, regarding exits and safety devices, ventilation, toilet facilities, and lighting of classrooms.

SUMMARY

Neither the state courses of study for physical education, the state codes for school buildings, nor the needs of the local community, as shown by the type of program carried on, seem to have been much of a factor in determining the facilities provided for physical education in these one hundred seven buildings. All three (courses, codes and programs) show such lack of common agreement as to what is essential, or desirable, that it is not difficult to understand why the different architects whose work is presented in this study showed the same lack of agreement. One should add to these causes of confusion the additional fact that most of the school committees concerned chose local architects with little regard to their experience in planning school buildings.

Chapter V

SUMMARY

THIS study was undertaken to determine to what extent the facilities that are provided for the physical education program conform to the standards for these facilities that have been set up by educators interested both in physical education and the planning of school buildings. The plans of all high school buildings that were submitted to the state departments of Massachusetts, New York, New Jersey, and Pennsylvania for the years 1927 and 1928 were drawn from the files and sketches made of the provision for physical education in each building. This included twenty-nine buildings in Massachusetts, fifty-one in New York, twenty-eight in New Jersey and forty-five in Pennsylvania. Because some of these were combination grade and high schools, alterations, or additions to already existing buildings, or buildings so small that only minor provision could be expected for physical education, eleven of the Massachusetts group, seventeen of the New York, eight in New Jersey and ten in Pennsylvania were eliminated from further consideration.

The one hundred seven sketches remaining, representing buildings costing over ten million dollars for Massachusetts, nearly fourteen million dollars for New York, nine millions for New Jersey and fifteen millions for Pennsylvania, were evaluated in two ways. First, using as a measure the standards set up by those who have worked most extensively in this field, it was shown that but few of these buildings merit a high rating for the physical education facilities provided. Only ten per cent had two gymnasiums although twenty-four buildings enrolled over a thousand pupils; a third of the gymnasiums were located under the auditorium, in less than a fourth of them was the ratio of window area to floor area one to five; and much space was used for permanent bleachers. Only in respect to size did the gymnasium conform to the generally accepted standards and even

here ten were less than the forty feet in width, given as the minimum, and six had a height of less than eighteen feet. On only three plans was special provision made for a corrective program; the office for the physical director showed a wide variation in respect to size and location, and but two of the buildings had a special room for physical examinations.

The widest divergence from the standards was shown in the provision for dressing rooms and showers, especially for girls. Some buildings made no provision for a dressing room while others allowed over thirty-five square feet per pupil in the largest class. There was practically no relation between the size of the physical education classes in these buildings and the number of showers. In Massachusetts the median number of showers in relation to the size of the class was one shower for each five girls. In New York it was one to ten, in New Jersey, one to twelve, and in Pennsylvania one to eight. The overhead shower was almost universally used although no physical education director was found who did not prefer the shoulder height for either boys or girls.

Such a variety of opinions was found regarding the type of dressing room and shower that should be furnished for girls that considerable time was spent trying to have the various types evaluated by those who were directing the girls' work. More of these favored as many separate dressing rooms and showers as there were girls in the class and eighty per cent objected to the gang shower plan that makes the same provision for girls as for boys. However, when several thousand girls gave their reasons why the shower should or should not be required after each gymnasium period, there were no more objections from buildings where the gang shower is used than from buildings with the most elaborate arrangement of showers and dressing rooms. Lack of privacy was seldom mentioned, but lack of time, danger of colds, and fear of infections were given as reasons for the objection to the requirement. Several directors refused to have the girls answer the question about the shower requirement because they did not want them to get the idea that the requirement was subject to questioning on the part of anyone. The number of showers and their cleanliness rather than their arrangement with relation to dressing rooms seem to be what determine whether girls do

or do not object to the shower. In the forty cities visited the shower was part of the physical education program in all places having as many showers as one for each three girls in the class whether there were no dressing rooms at all, or four for each shower, three for each shower, or two, or one. In no place visited was the shower a required part of the program, no matter what the arrangement of dressing rooms, when there were more than four girls in the class for each showerhead.

As a second measure of the facilities provided, a score card was developed with the help of seven state directors, twelve city directors and twenty-one professors of physical education. This included not only a description of what was considered to be needed for offices, gymnasium and service facilities, but under each of the twenty-three items into which the facilities were separated were descriptions of several levels, each level somewhat inferior to the one placed above it. Values were determined first for the three major items (the median of the value given by each of the directors and professors), next it was determined for the subdivisions under each of the major items, and then for each of the levels.

Blueprints were made of the one hundred seven sketches and the facilities were rated, through the use of the score card, by four judges and the average of these judgments taken as the final score for each facility. The total score for each building was low, only ten being rated as being worth over 500 out of the total of 1000 points. This low score was due not only to the lack of certain facilities like a corrective gymnasium, examination rooms, bleachers, or team rooms, but also because so many of the facilities that were included were at the lower levels. The girls' shower room received the lowest rating of any facility, but departmental offices, the location and light for the gymnasium, storage facilities, boys' showers and sanitary facilities were all scored low for a majority of the buildings. It was a simple matter to select plans to illustrate the three lower levels, difficult for the upper levels and impossible to show one of level a for dressing rooms, shower rooms or bleachers.

Seventy-three different architectural firms designed these one hundred seven school buildings. Few of them have specialized in school buildings to the extent that it represents half or more of their work.

Most of them are local firms with little experience in planning schools and were chosen by a building committee as poorly informed as themselves regarding the type of building needed to carry on a modern school program. Not knowing their lack of information they look upon suggestions from educators as being the "eccentricities of the school superintendent."

In general the state courses of study for physical education are too indefinite to be of any service to an architect or school committee seeking for help and where they are most definite there is the least agreement between the courses as to what should be required. That the state schoolhouse building codes are likewise vague can be seen when one considers that the plans for each of these one hundred seven schools were approved by the department of the state where it was built.

POSSIBLE REMEDIES

Local school committees will continue to select local architects to plan local schools just as they will continue to select local teachers for the buildings after they have been completed. It has been found to be highly desirable and also feasible for the state departments of the several states to limit the appointments of the school committee to those teachers who, either through an examination or by other evidence of adequate provision, have convinced the state department of education of their ability to perform the work they are employed to carry out.

Thirty-four of the states require submission of plans to some designated organization and in twenty-four of these it is the state department of education or state superintendent.¹ Probably no additional legislation would be needed to permit the department concerned to rule that they would consider only plans submitted by architects who had received state certificates authorizing them to plan school buildings.

As pointed out on page 151 the Delaware Code requires, and the Kentucky and Missouri Codes recommend, that skeleton plans be

¹ McGowan, Howard M., *An Analysis of the State School Building Codes of the United States*. Unpublished Master's Thesis, Ohio State University, 1929.

submitted to the department for their approval before working drawings are started. After an architect has completed a set of plans and secured their approval by the local school committee both the architect and committee resent what they choose to call interference on the part of the state department. If one can judge by the changes made on these one hundred seven plans after they were submitted to the department, the recommendations tend to be limited to the location, or hanging of a door, the width of pilasters between windows, the addition or elimination of a toilet, or the size of ventilation ducts. On the other hand when the architect submits pencil sketches he is anxious to secure suggestions that will help him secure the approval of the local committee for his plans. There is no extra expense element involved and since the state department knows the educational needs of the local community far better than does the architect or the local school committee and is quite as well informed as they concerning the financial ability of the district, the conference is certain to be helpful. Time is saved for both the architect and the school department when the state building code, as in Missouri, is sufficiently definite with "instructions and forms that are not mandatory but are suggestive of a proper method of procedure."

A second possibility is that of enacting by state law what should, or should not, be included in a school building. There is quite general agreement that this is not a desirable method of securing the desired result. In Massachusetts one school district has \$128,000 of assessed valuation behind each school child while another district has but \$2,700. A requirement that would be at all applicable to one would be entirely out of the question for the other.

McLure¹ pointed out ten years ago that fresh air was considered so essential that fourteen states required by statute that thirty cubic feet of air per minute must be delivered to the classrooms and that these laws have remained long after that amount of change has been shown to be neither necessary nor advisable.

Several recent studies confirm McLure's findings on the inadvisability of legal statutes regarding building requirements. Williams²

¹ McLure, John R. *The Ventilation of School Buildings*. Teachers College, Columbia University, Contributions to Education, No. 157, 1924.

² Williams, Frank. *Functions of State Departments of Education in Schoolhouse Planning*. Unpublished Master's Thesis, George Peabody College for Teachers, 1931.

studied the history of the work of state departments of education in eleven southern states that have departments of schoolhouse planning. His problem was to determine what should be included in the duties of the department and the necessary personnel and he concluded that the divisions of schoolhouse planning have developed from necessity, that the personnel should be increased, but the primary object of these divisions should be to render educational rather than architectural service. He especially emphasized that the school building code should be flexible and the state board of education should have power to adopt measures pertaining to school buildings which it sees are desirable for the good of the schools.

Votaw¹ states that the ever increasing appreciation of the close relationship of housing to educational efficiency justifies an effort to secure a clearer conception of state influence and control of school plant facilities. He particularly calls attention to the danger of depending upon legislation to care for public needs that are properly administrative. "Let a school tragedy occur just before or during a legislative session and laws are passed. An entirely different type of law or no law might be the result if twelve months intervened." After reviewing the laws of the various states relating to school buildings the possible motives behind the passage of these laws, and the judicial decisions relating to school plant facilities, he states: "In the light of changing standards and scientific development of construction, laws specifying school building standards coupled with delayed court decisions on the application of such laws are not adequate means for the state in exercising its true function and obligation in regard to school plant facilities. A school code could be utilized to administer in a statesmanlike manner the school building needs of the state."

Sahlstrom² used the fire escape on schools as one illustration of the continuance of a statute after the enclosed fire resistive stairway and corridor has been shown to be greatly superior. "How it has resisted the combined attacks of educational authorities, safety engi-

¹ Votaw, David Freeman. *The Influence of the State on Public School Plant Facilities*. Unpublished Doctor's Thesis, Leland Stanford Junior University, 1932.

² Sahlstrom, John W. *Some Code Controls of School Building Construction in American Cities*. Teachers College, Columbia University, Contribution to Education, No. 581, 1933.

neers, fire chiefs, and other qualified experts is a mystery." He adds: "The methods and content of the educational program are in a constant state of flux. Even the most conservative must admit that the progress of a decade may cause certain school building features to become quite inadequate or even obsolete." He recommends: "From the standpoint of efficiency, economy, and safety it would appear desirable to lodge complete control in that instrument which is not hampered by the limitations of the police power, which may command the services of competent specialists in both the educational and technical phases of construction, and which has at its disposal the facilities for administration, revision and research."

CONCLUSIONS

1. Probably a state building bulletin of standards in the department of education (not a legal code, suggestive, not mandatory, extensive enough to show many possible variations, revised annually by those most competent to judge what should be included) would help in securing better school buildings. Wood and Hixson¹ give as the unquestioned functions of a state bureau the control of safety facilities, the promotion of health and the enforcement of statutory requirements. They also claim that it is plainly its duty to see that suitable housing provision is made for carrying out efficiently all courses of instruction prescribed under state direction and authority. This study shows however that more is needed than a bulletin of standards, approval of school building plans and official progress inspections of building construction. Of the four states included in the study the state with the most restrictive code had the two poorest buildings (as well as the two best); the state with the most extensive department for checking building plans had the lowest scores for the physical education facilities, and in the state where the building plans were checked by the department of public safety, mainly for exits, stairs, sanitation and ventilation, the scores for facilities averaged the highest of the four states and with the narrowest range between the best and the poorest.

¹ Wood, Frank H. and Hixson, J. H. *The Function and Program of a State Bureau of Buildings and Grounds*. The Thirty-Third Year Book of the National Society for the Study of Education. Part I., pp. 91-101.

2. Registration of architects desiring to plan school buildings with a certificate based upon training and experience would weed out some of the most incompetent. The mere fact that a certificate was required, no matter how elementary the standards to be met, would force local architects to become somewhat familiar with the literature regarding schoolhouse planning.

3. Of far greater importance than either a state building code, or a license for architects is that there be more research as to what should be the nature of the facilities provided for physical education. It is almost axiomatic that the use to which anything is to be put determines its nature. The gymnasium in almost all schools is used for basket ball and that game has tended to fix the length, height, and to a lesser extent the width of the gymnasium and also has influenced the kind of floor and the nature of the walls. The natural light for the gymnasium is not a factor in matched games (usually played in the evening) and every variation of lighting from none to thirty per cent of the floor area was found in these one hundred seven buildings. The odor in the locker and shower rooms where toilet fixtures have not been provided is evidence that the shower drains have been used for a purpose other than that which was intended when the building was planned and that toilets should have been included.

For the other items the lack of agreement regarding their importance, location, size, lighting or equipment or even whether they should be provided at all, indicates how much more study regarding use is needed.

Each of the forty men and women who assisted in the construction and valuation of the several items and levels for the score card is either a state director, city director, or professor of physical education in a large university. A board member, superintendent, or architect planning a school building would tend to accept the opinion of anyone of them as the final authority as to what would be adequate for a modern physical education program, both as to what should be included and what might well be omitted. The tables on pages 56 and 58 show how widely they differed regarding the importance of the several items. For example the consensus of opinion of these

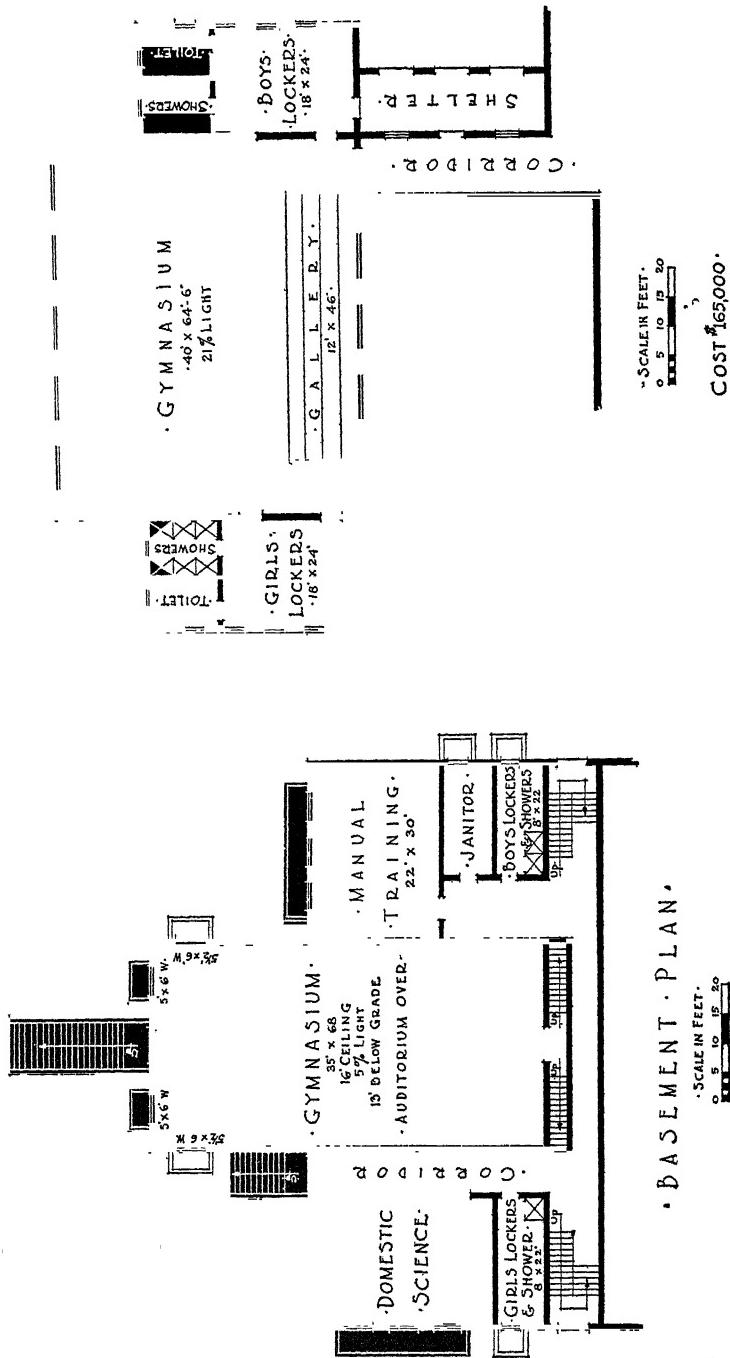
judges seems to be that the examination room is as important as the office for the physical director. One director, however, had the examination room four times as important as the office and one had the office four times as important as the examination room.

4. The physical education facilities that should be provided for the small high school is a question that needs much study. No one of the combinations of gymnasium as stage of the auditorium, part of the floor of the auditorium, under the auditorium, or dual purpose auditorium-gymnasium has been satisfactory. When through lack of funds some combination must be made the preferable choice seems to be a gymnasium to be used at times as an auditorium rather than an auditorium to be used frequently as a gymnasium. If the size, walls, floor, windows, heating and lighting fixtures are planned for an activity program the room can be converted to a "sitting and listening program" with much less difficulty than an auditorium can be changed to a gymnasium.

The buildings illustrated on page 162 show how differently two architects handled the problem of planning physical education facilities for a building with a small enrollment. In one case the gymnasium lies in an excavation under the auditorium. It lacks five feet of having the minimum width and two feet of the minimum height necessary for basket ball. The windows are small and poorly located. The locker and shower rooms, with one shower for girls and two for boys, are too inadequate to be of any service. The principal of the building has not been able to conform to the state law regarding physical education because he lacked the proper facilities. The money that was spent was almost entirely wasted.

The other building cost about 18 per cent more but the gymnasium is in a separate wing, is lighted from both sides and the playing area is adequate in size and height. The locker rooms will not accommodate large classes but they, as well as the adjacent locker and toilet rooms, are well lighted.

Since in a small high school the gymnasium is used on alternate days by boys' and girls' classes, there seems to be no logical reason why the use of the locker and shower rooms should not alternate in the same manner. This would double these facilities so far as their usefulness is concerned with no increase at all in the cost.



5. Engelhardt and Engelhardt¹ have emphasized that "a school building, once constructed, must be used by generations of school children regardless of whether the most advantageous kind of educational program may be advanced therein, or whether the health and safety of school children were given paramount consideration in the original planning." Either through lack of knowledge of what the physical education facilities should be, or lack of knowledge regarding school building planning, the school administrative staff in many of the communities represented by this study has received a building where desirable facilities have been omitted, or provided at a low level. In a few buildings the less desirable features like bleachers and team rooms have been unduly expanded at the expense of facilities that are more essential. The school superintendent as the educational leader cannot place all of the blame upon the architect and schoolhouse building committee when a new building planned and erected during his administration fails to provide the facilities that will permit "the most advantageous kind of education to be advanced therein."

¹ Engelhardt, N. L. and Engelhardt, Fred. *Planning School Building Programs.* Bureau of Publications, Teacher's College, Columbia University, 1930.

BIBLIOGRAPHY

STATE COURSES OF STUDY IN PHYSICAL EDUCATION

- Alabama—*Manual for Junior and Senior High Schools*. 1920.
- California—*Manual for Physical Education*. 1928.
- Score Card for Evaluation of Physical Education*. 1931.
- Connecticut—*Manual of Physical Education for Secondary Grades*. 1923.
- Delaware—*Course of Study Physical and Health Education*. 1932.
- Florida—*State Syllabus Health and Physical Education for Senior High Schools*. 1926.
- Georgia—*Health Manual for Georgia Schools* (no date).
- Illinois—*High School Physical and Health Education*. 1931.
- Indiana—*The Health Education and Physical Education Program for Indiana High Schools*. 1930.
- Iowa—*Physical Education Bulletin*. 1924.
- Maine—*Course of Study in Health and Physical Education*. 1928.
- State School Bulletin. Approved Physical Education Program*. 1931.
- Massachusetts—*Physical Education in the Public Schools*. 1922.
- Michigan—*Physical Training for the City Schools Bulletins*, No. 2, 1914; No. 3, 1919; No. 4, 1923.
- Minnesota—*Manual of Physical and Health Education*. 1924.
- Physical Education for Junior and Senior High School Periods*. 1932.
- Missouri—*Manual for Physical Training in High Schools*. 1922.
- Courses of Study in Junior and Senior High Schools*. 1925, 1927.
- Nevada—*Course of Study for Physical Education*. 1917.
- Standards in Physical Education*. 1932.
- New York—*General Plan and Syllabus for Physical Training*. 1917.
- Physical Education. A résumé for Teachers and Administrators*. 1929.
- North Carolina—*Physical Education in the High School*. 1926.
- North Dakota—*Syllabus for Physical Education in the High School*. 1922.
- Ohio—*Health and Physical Education Series, Vol. III.—A Program for Junior and Senior High Schools*. 1932.
- Oklahoma—*A Course of Study for Health Education*. 1927.
- Oregon—*A Practical Recreation Manual for Oregon Schools*. 1917. Revised 1925.
- Course in Physical Instruction for the Schools of Oregon*. 1919. Revised 1924.
- Pennsylvania—*Course of Study in Physical Education. Grades IX—XII*. 1925.

- Physical Education in Small Secondary Schools.* 1928.
Rhode Island—*Syllabus for Physical Education.* 1917.
Tennessee—*Manual in Physical Education.* 1926.
Texas—*Course of Study.* 1927.
Utah—*Program of Instruction and Courses of Study in Health and Physical Education.* 1930.
Virginia—*Play and Athletics for the Public Schools.* 1919.
Physical and Health Education. 1929.
West Virginia—*Course of Study for Junior and Senior High Schools.* 1929.
Wisconsin—*A Manual of Physical Education.* 1931.

STATE SCHOOL BUILDING CODES

- Alabama—*How the State Aids in Building Schools.* 1930.
Connecticut—*Construction of School Houses. Laws Relating to and Recommendations for.* 1930.
Delaware—*Minimum Standards for School Buildings and Sites.* 1927.
Indiana—*Indiana High School Standards.* 1924.
Idaho—*School House Plans.* 1921.
Illinois—*Illinois Representative High Schools.* 1927.
Illinois School Buildings (no date).
Kentucky—*Suggestive Rules and Regulations for Public School House Planning.* 1933.
Maryland—*Standard Maryland Schools.* 1930.
Massachusetts—*Laws Relating to the Erection, Alteration, Inspection and Use of Buildings.* 1928.
Regulations Relative to the Inspection of Buildings. 1931.
Michigan—*School Buildings, Equipment and Grounds,* 1922.
Minnesota—*Laws and Rules Governing School Buildings, Sites.* 1928.
Missouri—*Schoolhouse Planning and Construction.* 1933.
Nebraska—*Rural and Village High Schools.*
New Jersey—*The Law and Rules and Regulations of the State Board of Education Concerning Public School Buildings.*
New York—*Laws, Rules and Information Relating to School Building Construction.* 1926.
North Carolina—*School House Planning.* 1923 (?).
Oklahoma—*For Better School Houses* (no date).
Ohio—*State Building Code.* 1930.
Pennsylvania—*Rules and Regulations for Public School Building Construction.* 1931.
Texas—*School Grounds, School Buildings and Their Equipment.* 1922.
Utah—*Laws, Statutes, Plans* (no date).
Washington—*Representative School Buildings.* 1933.

UNPUBLISHED THESES

DEVELOPMENT AND GROWTH

- McLean, R. H. *Physical Education in Public Secondary Schools in the United States*. International Y.M.C.A. College, Springfield, Massachusetts. 1914.
- Jorgensen, Alberta W. *Progress of Physical Education in the Public Schools of the United States During the Decade, 1910-1920, with Special Reference to Legislation and Curricula*. New York University. 1929.

LEGISLATION

- Gorman, Fred Robert. *Legal Status of Physical Education in Public Schools of the United States*. Indiana University. 1929.
- Spangler, Thomas B. F. *The Legal Status of Health Education in the Public Schools of the United States with Special Reference to Physical Education and Hygiene*. Temple University. 1929.
- Weinke, Ernest A. *Needed Legislation for Physical Education*. University of Wisconsin. 1924.

FACILITIES

- Perry, Elmer J. *A Study of the Construction, Equipment, and Utilization of Boys' Gymnasium, Locker and Shower Rooms in Southern California High Schools*. University of Southern California. 1931.
- Shields, A. W. *Auditorium-Gymnasium Facilities in Ohio High Schools Under County Supervision in 1929-1930*. Ohio State University. 1930.
- Winter, Arthur R. *A Study of the Trends in Gymnasium Construction*. New York University. 1930.

PROGRAM

- Schutte, Fred K. *Objectives of Physical Education in the United States, 1910-1929*. New York University. 1930.
- Staley, Seward C. *The Program in Physical Education in the High School*. University of Illinois. For Ph.D. Degree. 1929.
- Thrall, Iskah R. *A Survey of the Records Kept by the Girls' Physical Education Departments in the Secondary Schools of California*. University of Southern California.

STATE CODES

- McGowan, Howard M. *An Analysis of the State School Building Codes of the United States*. Ohio State University. 1929.
- Votaw, David Freeman. *The Influence of the State on Public School Plant Facilities*. Leland Stanford Junior University. D.Ed. Degree. 1932.
- Williams, Frank. *Functions of State Departments of Education in School House Planning*. George Peabody College for Teachers. 1928.

BOOKS

- American School and University—*Year Books*, 1928-29, 1929-30, 1930-31, 1931-32, 1932-33. American School Publishing Corporation, New York.
- Caswell, Hollis L. *City School Surveys*. Teachers College, Columbia University. Contribution to Education. 1929.
- Cooper, Frank I., Chairman, National Educational Association. Report of Committee on School House Planning. 1925.
- Davis, Elwood C. *Methods and Techniques Used in Surveying Health and Physical Education in City Schools*. Teachers College, Columbia University. Contributions to Education. No. 515. 1932.
- Engelhardt, N. L. *Standards for Junior High School Buildings*. Bureau of Publications, Teachers College, Columbia University. 1932.
- Engelhardt, N. L., Chairman. National Society for the Study of Education. *Thirty-third Year Book*, "The Planning and Construction of School Buildings." Public School Publishing Company. 1934.
- Flanders, Jesse K. *Legislative Control of the Elementary Curriculum*. Teachers College, Columbia University. Contribution to Education. No. 195. 1925.
- Harrison, W. K. and Dobbin, C. E. *School Buildings of Today and Tomorrow*. Architectural Book Publishing Company, New York. 1931.
- Hart, Frank. *A Standard State School Housing Code*. C. F. Williams and Son, Albany, New York. 1924.
- Keene, Charles H. *The Physical Welfare of the School Child*. Houghton Mifflin Company, Boston. 1929.
- McLure, John R. *The Ventilation of School Buildings*. Teachers College, Columbia University. Contributions to Education. No. 157. 1924.
- Nash, Jay B. *The Administration of Physical Education*. A. S. Barnes and Company, New York. 1931.
- Rogers, Frederick Rand. *Tests and Measurement Programs in the Redirection of Physical Education*. Bureau of Publications. Teachers College, Columbia University. 1927.
- Stetson, Fred L. and Cozens, Frederick W. *The Organization and Administration of Health Education in the Secondary Schools of the United States*. University of Oregon. 1927.
- Strayer, G. D. and Engelhardt, N. L. *Standards for High School Buildings*. Bureau of Publications, Teachers College, Columbia University. 1924.
- Williams, Jesse F. *Principles of Physical Education*. W. B. Saunders Company, Philadelphia. 1927.
- Williams, Jesse F. and Brownell, Clifford L. *The Administration of Health and Physical Education*. W. B. Saunders Company, Philadelphia. 1927.

SURVEYS USED IN THIS REPORT

1900	Chicago, Illinois
1911	Baltimore, Maryland
	Boston, Massachusetts
1912	Atlanta, Georgia
	New York City, New York
1913	Antigo, Wisconsin
	Boise, Idaho
	Bridgeport, Connecticut
	Newburgh, New York
	Portland, Oregon
1914	Blaine, Washington
	Butte, Montana
	San Francisco, California
	South Bend, Indiana
	Springfield, Illinois
1915	Ashland, Oregon
	Leavenworth, Kansas
	Salt Lake City, Utah
	San Antonio, Texas
1916	Boston, Massachusetts
	Buffalo, New York
	Cleveland, Ohio
	Denver, Colorado
	Grand Rapids, Michigan
1917	Akron, Ohio
	Brookline, Massachusetts
	Portland, Oregon
	San Francisco, California
	St. Louis, Missouri
1917-18	Anderson, Indiana
1918	Alton, Illinois
	Columbia, South Carolina
	Elyria, Ohio
	Gary, Indiana
	Paterson, New Jersey
1919	Binghamton, New York
	Boise, Idaho

- Memphis, Tennessee
Utica, New York
1920 Amsterdam, New York
Scranton, Pennsylvania
1921 Athens, Georgia
Baltimore, Maryland
High Schools in State of Connecticut
Elizabeth City, North Carolina
Niagara Falls, New York
Wheeling, Virginia
Wilmington, Delaware
1921-22 Atlanta, Georgia
1922 Appleton, Wisconsin
Augusta, Maine
Bangor, Maine
Cleveland Heights, Ohio
Des Moines, Iowa
Duluth, Minnesota
El Paso, Texas
Harrisburg, Pennsylvania
Mount Vernon, New York
New Bedford, Massachusetts
1923 Alexandria, Virginia
Birmingham, Alabama
Dodge City, Kansas
Norristown, Pennsylvania
Stamford, Connecticut
1923-24 Providence, Rhode Island
1924 Cedar Rapids, Iowa
Springfield, Massachusetts
1924-25 Recreation Survey, Buffalo, New York
Health Survey of 96 Cities
Davenport, Iowa
Lancaster, Pennsylvania
1925-26 Aberdeen, South Dakota
Education in 12 Cape Cod Towns, Massachusetts
Hammonton, New Jersey
Port Arthur, Texas
Terre Haute, Indiana

CITIES VISITED

Massachusetts

Director

Brookline	Thomas Hines, Bessie Barnes
Lowell	Donald McIntyre
Milton	Aaron Yeaton
Newton	Erving Wilson
Norton	Bennett Murray
Reading	Philip Althoff
Springfield	Franklin Gray
Waltham	Louise Sewall
Wellesley	Winifred Bailey
Winchester	Wendell Mansfield

New York

Albany	Isador Yavitz
Batavia	Raymond Pierce
Beacon	Roland Gray
Gloversville	L. A. Miller
Lockport	A. E. Gay
Lynbrook	J. J. Carter
Niagara Falls	Harold Herkimer
Rochester	Herman Norton
Schenectady	E. T. Grout
Troy	C. R. Mann

New Jersey

Atlantic City	Thomas A. Barker
East Orange	Dorothy La Salle
Montclair	Franklin G. Armstrong
New Brunswick	Gretchen Smith
Orange	Carl Seibert
South Orange	Thomas W. Higbee
Summit	Grace E. Jones
Trenton	Walter E. Short
Westfield	Gertrude Swift
West Orange	Grace C. Moses

PHYSICAL EDUCATION FACILITIES

<i>Pennsylvania</i>	
Altoona	Robert Wolfe
Easton	Benjamin Everitt
Erie	D. C. Evans
Harrisburg	H. G. Geisel
Hazleton	Elma Edson
Johnstown	Hugo Thomas
Meadville	Vera Rummel
Reading	Alexander Harwick
Scranton	Burton Derby
York	John W. Meiner
Wilkes-Barre	A. L. Rummer

INDEX

- Anderson, Alfred O., 56, 58
 Apparatus, storage, 29, 65, 98-104
 Illustrations of provision made for, 99-102
 Scoring of, 103-104
 Architects, 9, 141, 143
 Co-operation of school architects, 9
 Local architects preferred, 143
 Many different architects selected for schools, 141
 Armstrong, Franklin G., 56
 Athlete's foot, fear of, 44
 Auditorium-gymnasium, 27

 Bleachers, 26, 51, 65, 91-98
 Illustrations of provisions made for, 93-96
 Scoring of, 97-98
 Bovard, John F., 56, 58
 Braucher, Howard, 56
 Brewer, Chester L., 56, 58
 Brownell, Clifford L., 8, 13, 17, 18, 20, 22, 24, 25, 27, 29, 30, 32, 35, 39, 46, 49, 56, 58
 Building Codes for schools, 149-151
 Buildings included in this study, 10

 Caswell, H. L., 4
 Clarke, H. Harrison, 56, 58
 Classes, size in physical education, 38
 Classification in physical education, 144
 Codes, State, for schools, 149-151, 156
 Colestock, Claire, 56
 Corrective gymnasium, 28, 52, 65, 98
 Cost for physical education facilities, 8
 Cozens, Frederick W., 56, 58

 Davis, Elwood G., 4
 Dobbins, C. E., 12, 15, 25, 29, 31, 35
 Dressing and locker rooms, 30, 52, 65, 104
 Size, 32, 33
 Illustrations of provision made for boys' dressing rooms, 105-108
 Illustrations of provision made for girls' dressing rooms, 117-120
 Location of, 32
 Scoring for boys' dressing rooms, 65, 109
 Drying rooms for athletic clothing, 49, 68, 133

 Edwards, C. Harry, 56, 58
 Engelhardt, Fred, 163
 Engelhardt, N. L., 13, 15, 17, 18, 20, 22, 24, 25, 26, 29, 30, 31, 35, 48, 163
 Examination rooms, 14, 50, 63, 75
 Exhibitions in promoting publicity, 144

 Flanders, Jesse K., 6
 Floors,
 Gymnasium, 25, 64, 88
 Locker and shower rooms, 34, 36
 Foot, Athlete's, fear of, 44

 Geisel, Horace G., 56, 58
 Giauque, Charles D., 56, 58
 Gorman, Fred R., 6
 Gymnasium-auditorium, 27
 Gymnasium, 16-30, 63-65, 75-104
 Apparatus storage, 29, 65, 98-104
 Illustrations of provisions made for, 99-102
 Scoring of, 103-104
 Bleachers, 26, 51, 65, 91-98
 Illustrations of provisions made for, 93-96
 Scoring for, 97-98
 Corrective, 28, 52, 65, 98
 Floors, 25, 64, 91
 Light, 22, 64, 85-91, 136-140
 Illustrations of provision made for, 86-89
 Scoring for, 90
 Number, 16, 50, 63, 75-77
 Scoring for, 76-77
 Size and height, 20, 64, 83-85
 Scoring for, 84-85
 Stage for auditorium, 18, 27

 Harrison, W. K., 12, 15, 25, 29, 31, 35
 Hart, Frank, 11, 13, 17, 20, 21, 22, 26, 31
 Hendricks, George F., 56, 58
 Herkimer, Harold W., 56, 58
 Hixson, J. H., 159

 Jallade, Louis, 16, 21, 22, 24, 25, 26, 31, 34
 Jones, Hiram, 56, 58
 Jorgensen, Alberta W., 7

 Keene, Charles H., 16, 20, 21, 22
 Keith, John A. H., 143
 Keller, F. G., 56, 58

- La Porte, William, 58
 La Salle, Dorothy, 56, 58
 Laundering, 49
 Laws,
 Relating to physical education, 1-3
 Relating to school buildings, 146-148
 Lee, Mabel, 58
 Light for gymnasium, 22, 64, 83, 85,
 136-140
 Locker rooms (see dressing and locker
 rooms)
 McCloy, G. H., 56, 58
 McGowan, Howard M., 156
 McLean, R. H., 3
 McLure, John R., 157
 Maroney, F. W., 56, 58
 Meredith, W. F., 7
 Measurement,
 Classification, 144
 Rogers' physical fitness, 145
 Mitchell, Elmer, 56
 Nash, Jay B., 8, 13, 16, 17, 20, 21, 22,
 24, 25, 26, 28, 29, 31, 34, 39, 48, 49
 Neilson, N. P. (California Score Card),
 12, 14, 16, 20, 21, 24, 25, 26, 28,
 29, 30, 34, 46, 48, 49, 56, 58
 Number of gymnasiums, 16, 50, 63, 74-76
 Scoring for, 74-76
 Oberteuffer, D., 148
 Offices for physical education director,
 Illustrations of provision made for,
 70-72
 Location, 12, 14, 62
 Size, 12, 15, 62
 Scoring for, 74, 75, 138
 Objectives in physical education, 143
 Patty, W. W., 56
 Physical education,
 A new subject, 3
 Cost of facilities, 8
 Indefiniteness of state courses, 146-149
 Objectives, 143
 Scores for total facilities, 134-135
 State building codes affecting facilities
 provided, 149
 Variety of facilities provided, 8
 Variety of programs for, 131-134, 143-
 145
 Rath, Emil, 56, 58
 Ready, Marie M., 16
 Rogers, Frederick Rand, 39, 58
 Rogers, James F., 58
 Rowe, Floyd A., 56
 Rugg, Harold O., 140
 Sahlstrom, John W., 158
 Sandlin, R. N., 56, 58
 Savage, C. W., 56
 Sanitary facilities, 48, 53, 67, 127-133
 Illustrations of provision made for,
 127-131
 Scoring for, 116, 121, 122, 133
 School surveys on physical education
 facilities, 4-6
 Schrader, Carl L., 56, 58
 Schutte, Fred K., 143
 Score card for measuring physical edu-
 cation facilities, 54-68
 Scott, Harry A., 56, 58
 Sharman, Jackson, 56, 58
 Showers,
 Illustrations of provision made for
 boys' shower rooms, 111-114
 Illustrations of provision made for
 girls' shower rooms, 117-120
 Location of shower heads, 36
 Number of showers, 34, 36, 42
 Opinion of high school girls regarding,
 43-46
 Opinion of physical education instruc-
 tors regarding, 37-43
 Relation between number of showers
 and size of class, 34-37, 38, 42
 Scoring for boys' shower rooms, 115,
 138
 Scoring for girls' shower rooms, 121,
 138
 Skylight for gymnasiums, 22
 Stage, gymnasium used for, 18, 27
 Staley, Edward C., 143
 Steinbaus, Arthur H., 56, 58
 Strayer, George D., 13, 17, 18, 20, 21,
 22, 24, 25, 26, 29, 30, 31, 35,
 48
 Team room, 46, 53, 67, 122
 Illustrations of provision made for, 123-
 126
 Towel and suit facilities, 48, 53, 68, 133
 Uhler, William P., 56, 58
 Votaw, David F., 158
 Weinke, Ernest A., 7
 Williams, Frank, 157
 Williams, Jesse F., 8, 13, 17, 18, 20, 21,
 22, 24, 25, 27, 29, 30, 31, 35, 46,
 49, 56, 58
 Wilson, Charles C., 56
 Wilson, Pearl E., 147
 Wolfe, Robert H., 56, 58
 Wood, Frank H., 159